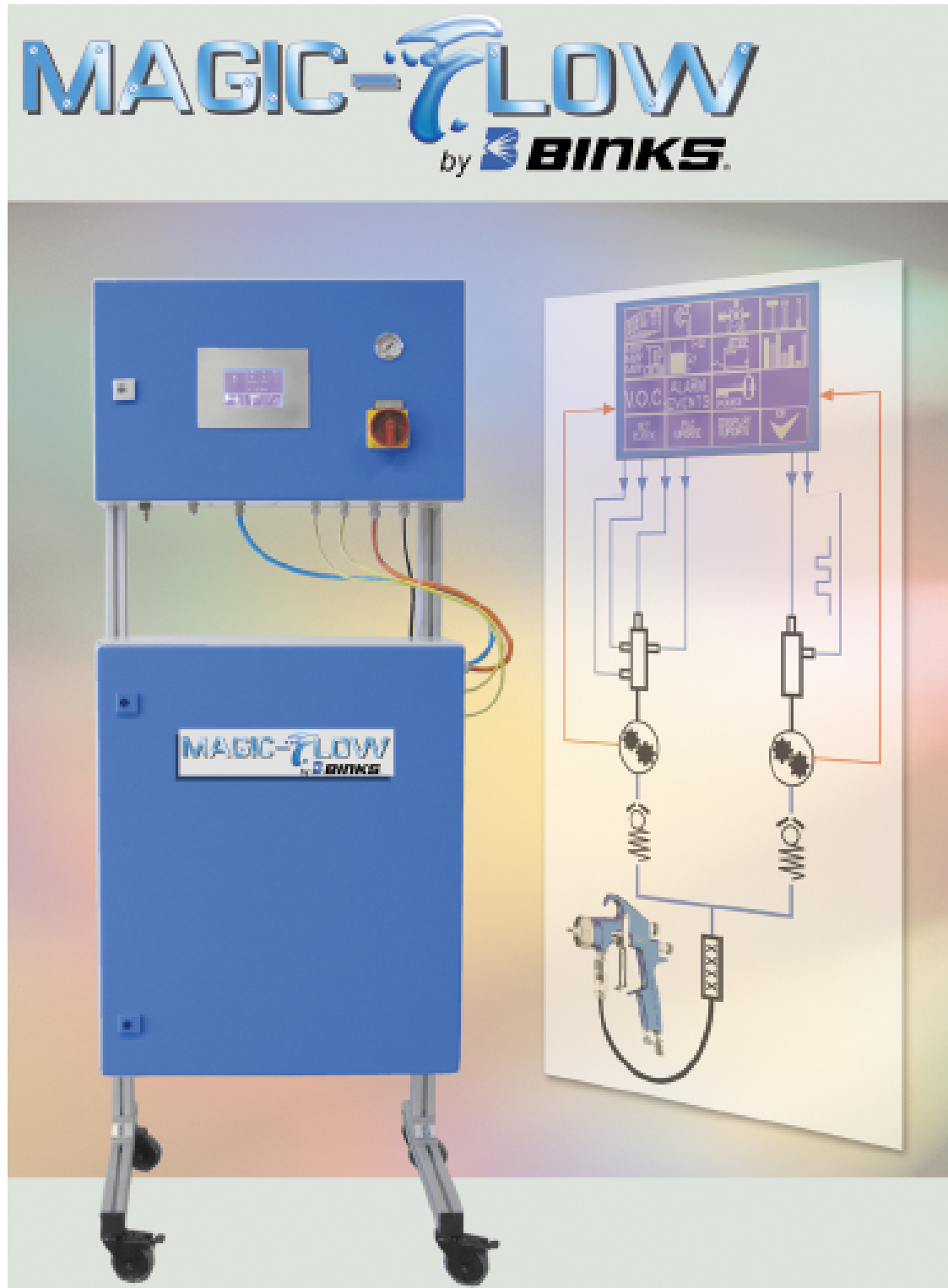


Service Manual

"Magic Flow"



Content

1 Identification Data

1.1	Preface	Page 5
1.2	Identification of the Installation	Page 5
1.3	Limited Warranty	Page 5

2 General

2.1	Notes for the User	Page 6
2.2	General Safety Standards	Page 6
2.3	Reaction Hazard	Page 7
2.4	Fire and Explosion Hazard	Page 7
2.6	Injection Hazard	Page 7
2.7	Hazard by Escaping Liquids	Page 7
2.8	Emergency Shutdown	Page 8
2.9	Residual Pressure	Page 8

3 Description of the System

3.1	Functional Characteristics	Page 9
3.2	Mixing	Page 9
3.3	Material Supply	Page 9

4 Installation

4.1	Transportation	Page 10
4.2	Storage	Page 10
4.3	Installation	Page 10
4.4	Electrical Connections	Page 11
4.5	Pneumatic Connections	Page 11
4.6	Material Connections	Page 11

5 Operation of the Installation

5.1	General	Page 12
5.1.1	Turn on the Installation	Page 12
5.1.2	Input of Numbers	Page 12
5.2	Main Menu	Page 13
5.2.1	Select Recipe	Page 13
5.2.2	Start Spraying Procedure	Page 13
5.2.3	Start Flushing Procedure	Page 13
5.2.4	Adjust Settings	Page 14
5.3	Painting / Mixing	Page 15
5.4	Flushing	Page 18
5.5	Settings	Page 20
5.5.1	Recipes	Page 21
5.5.2	Administration of Flushing	Page 23
5.5.3	Valves	Page 25
5.5.4	System Settings	Page 26
5.5.5	Calibrate / Adjust K-Factors	Page 28
5.5.5.1	Manual Adjustment of K-Factors	Page 28
5.5.5.2	Determine K-Factors	Page 28
5.5.6	Container Control	Page 31
5.5.7	Printer Configuration	Page 32

5.5.8	Reports	Page 33
5.5.9	V.O.C. Values	Page 34
5.5.10	Alarm Memory	Page 35
5.5.11	Security Codes	Page 36
5.5.12	Time	Page 37
5.5.13	PLC Update	Page 38
5.5.14	Display Update	Page 38
5.5.15	Optional Software	Page 39
5.5.15.1	Control Flushing Pockets	Page 39

6 Maintenance

6.1	Cleaning and Maintenance of Material Component	Page 40
6.1.1	Cleaning of Hoses and Tubes	Page 40
6.1.2	Maintenance of Valves	Page 40
6.1.3	Maintenance of Metering Cells	Page 40
6.2	Cleaning of Control Module	Page 40

7 Troubleshooting and Alarm Messages

Page 41

8 Spare Parts and Options

Page 44

8.1	Spare Parts and General Options	Page 44
8.2	Components with Spare Parts Lists	Page 47
8.2.1	Material Valve 2K-2014	Page 47
8.2.2	Material Valve 2K-4002	Page 48
8.2.3	Material Valve CCV-403-SS-E (Low Pressure)	Page 50
8.2.4	Volumeter	Page 52
8.2.5	Air Flow Monitor	Page 54
8.2.6	Accessories Material Valve	Page 55
8.2.7	Touch Panel	Page 59

9 Installation Shut-Off

Page 60

10 Annex

10.1	Flow Chart	Page 61
10.2	Connect Material Component and Electrical Cabinet	Page 62
10.3	Technical Characteristics	Page 64

Personal Notes	Page 65
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EG-Konformitätserklärung

im Sinne der EG-Richtlinien

- **Maschinen 93/68/EWG, Anhang II B,**
- **Elektromagnetische Verträglichkeit 89/336/EWG geändert durch 92/31/EWG**
- **Niederspannung 73/23/EWG**

Die Anlage/Maschine


Funktion: Elektronische 2 bzw. 3-Komponenten Misch-
 und Dosieranlage
Handelsname: Magic Flow
Typenbezeichnung: 2K-2000

wurde entwickelt, konstruiert und gefertigt in Übereinstimmung mit den
zuvor genannten Richtlinien.

Folgende harmonisierten Normen wurden angewandt:

- DIN 60204-1
- ZH 1/406
- ZH 1/200
- EN 50082-2-1993
- EN 50082-2-1995

Hersteller: Finishing Brands Germany GmbH
 Justus-von-Liebig-Str. 31
 63218 Dietzenbach
 Deutschland


.....
André de Neergaard
(Geschäftsführer)

1 Identification Data

1 Introduction

1.1 Preface

Dear Customer,

May we congratulate you for having purchased your new electronic Multi-Component Installation.

Please be assured that design and fabrication of the installation have been carried out according to state-of-the-art and with the intention of greatest possible user comfort, highest safety level and selection of the best material.

May we point out that careful study and continued use of this manual will provide a better understanding of the equipment and process, resulting in more efficient operation, longer trouble-free service and faster, easier troubleshooting. Please make sure that this installation must only be operated by adequately trained personnel. For your safety also refer to the service manuals of peripheral equipment, i.e. pumps, guns, and electrostatic equipment.

If you do have questions regarding the equipment, please contact our distributors or us. We will be pleased to help you.

1.2 Identification of the Installation

If you do have any questions regarding the product please note the exact type identification of the installation. You will find it on the type plate of the installation. This will help to identify the installation regarding modification and equipment so that we can offer qualified help to you.

1.3 Limited Warranty

All Finishing Brands equipment and spare parts are manufactured of the best materials and with the most modern production procedure. Should you still have reason for a claim send the defective part or the defective component directly to Finishing Brands or to our distributor. Please understand that we cannot accept any unfranked delivery. If your warranty claim is legitimate, we will refund transportation costs to you.

We will check, replace, or repair defective parts that fall within the warranty. The repair will be made in our house. If you wish the repair to be carried out at your site, you will be charged for any eventually arising travel costs.

If, in our opinion the warranty item in question, or other items damaged by this part was improperly installed, operated or maintained, we will assume no responsibility for repair or replacement of the item or items.

Excluded from the warranty are normal wear parts, i.e. gaskets, packings and nozzles.

Warranty period will be twelve months at one-shift operation, respectively six months at two-shift- and three-shift operation, starting from date of initial operation, latest 30 days after delivery. Any other agreements must be drawn up in writing.

2 General

2.1 Notes for the User

The safety precautions and safety standards of this section have been compiled for your safety and in your own interest. For safe operation it is necessary that the user reads and understands all of the technical and safety literature. The user must be familiar with the function of the installation und must be aware of the hazards and risks that may occur with pressurized pumps, hoses, and equipment.

2.2 General Safety Standards

- DO NOT move, operate, maintain or service the installation before reading and understanding this service manual. If you do have any doubt or problem, contact your superior or our representative.
- NEVER leave tools or other mechanical components in the installation if it is in operation or if it shall be started.
- NEVER exceed the maximum pressure of the installation. The maximum pressure of the installation is defined by the component with the lowest maximum pressure. You will find the maximum pressure of the installation at the type plate.
- When replacing components ALWAYS exercise care that the new parts comply with the technical data regarding material and maximum pressure.
- ALWAYS ensure that the spray area is properly ventilated according to legal requirements.
- The equipment must ONLY be operated by authorized and adequately trained personnel who have read and understood local codes, appropriate legal requirements and this service manual. The personnel must wear personal protection clothes and use appropriate tools during operation and maintenance.
- Before attempting any work ALWAYS ensure the pressure is relieved from all air and fluid hoses. Shut off pressure air supply to the installation and relieve all pumps connected to the installation.
- Before attempting any work at the electrical cabinet ALWAYS ensure the board is current less. It is not sufficient that the main switch is in OFF position. You must interrupt the complete current supply to the board.
- When working with high-pressure spray equipment ensure that the guns are NEVER operated without protection against accidental contact. ALWAYS activate the safety-locking lever when not using the gun, in order to prevent from unintended opening.
- When finishing maintenance and repair works replace ALL protection covers that have been removed from movable parts.

- The use of other than genuine spare and accessory parts will void warranties.
- After a longer period of shutdown check ALL components for leakage and proper function.

2.3 Reaction Hazard

All fluid conducting parts of the installation are made of stainless steel in order to avoid possible chemical reaction. However, in individual cases a chemical reaction might occur if aggressive or chemically active materials are being used, which might lead to dissolution or, in the worst case, to an explosion. If you want to use such materials, contact the fluid manufacturer prior to operation in order to check the compatibility of the fluid with different kinds of stainless steel.

2.4 Fire and Explosion Hazard

High flow rates of non-conductive materials may lead to an electrostatic charging. This phenomenon frequently appears with airless systems because the flow rate is very high and the material will be sheared and burst off at a small gap. In order to avoid charging and spark discharge, all components must be electrically connected with each other and grounded. Use suitable clamps and clean the contact parts of spray mist, if necessary. Connect the clamps via suitable cable with sufficient mass potential (permanently installed tubes etc.). If an electrostatic charging occurs, check for proper grounding.

2.5 Toxic Solvents

Toxic and harmful vapors may be set free by the spray and mist of paints and other materials. Follow all safety instructions of the manufacturer, keep to the relevant lower toxic limit values and maintain adequate ventilation.

2.6 Injection Hazard

- Never let any part of the body come in contact with the tip of the spray gun.
- Never aim high-pressure spray guns at any part of the body or at other persons under any circumstances.
- The spray stream of high-pressure spray equipment can puncture the skin and cause great harm. If such an incident occurs, in spite of all safety precautions, seek medical care immediately and inform the doctor about the penetrated material (see material data sheet).

2.7 Hazard by Escaping Liquids

Never modify the connections of the installation without prior contact with a responsible person.

Regularly check the condition of hoses and connections. Take care that hoses are not crushed and bent below the allowed radius.

Never overstrain hoses and connections by high mechanical load. Immediately replace damaged hoses!

Check all connections prior to operation.

Never try to stop or deflect leaking material with your hands or other parts of the body.

2.8 Emergency Shutdown

In case of an accident or a hazardous situation turn the main switch in OFF position. This will set all components of the panel current less and will close all valves.

2.9 Residual Pressure

Even after interruption of the air supply to the pumps, the lines fed by the pumps are still not depressurized, as pressure can only be relived into one direction. In order to depressurize the complete installation, open the spray gun und the relevant valves via the control device (if no relief device is installed at the pumps).

3 Description of the System

3.1 Functional Characteristics

The system is designed to meter two or three volume flows, in which the main volume flow (generally the main component) will be opened and all other components (e.g. the hardener) will be regulated on basis of the metered first volume flow according to the mixture ratio of the chosen recipe. All parameters and tolerance values that are necessary for the calculations will be deposited in the system settings. In order to guarantee highest possible safety, the function of the metering sensors will be controlled on the one hand, and on the other hand the installation will be shutdown if the demanded mixture ratio has not been achieved (e.g. insufficient material).

On the basis of the high precision of the mixing and the controlled and economic treatment with solvents and paint materials the electronic mixing and metering installations are clearly superior to the mechanical metering installations.

3.2 Mixing

The installation is designed to regulate and inject the B component (optional also C) into the running volume flow of side A. To obtain a good mixing result it is necessary to connect a static mixer to the outlet of the installation (not included in scope of delivery of basic installation). Care must be taken that the static mixer complies with the maximum pressure of the complete installation. The length of the mixer, the number of mix steps, and the diameter are depending on the used paint material, the mixture ratio and the maximum volume flow. It may be necessary to insert a downstream hose mixer (e.g. at very high flow rates).

3.3 Material Supply

Material supply will be made either by piston pumps, double diaphragm pumps, and mono diaphragm pumps, or by pressure tanks. Care must be taken that all components are operating in a similar pressure range. The combined operation with pressure tanks and high ratio piston pumps is not recommendable.



It must be ensured that that the components of side B (eventually also side C) have a higher pressure, approximately 10%, than side A-, in order to be metered and added on.

For proper operation of the installation at least the following equipment is necessary:

- One fluid supply for side A
- One hardener supply for side B
- One flushing agent supply (according to paint system two off are possible)
- If necessary, one thinner supply (for 3C installation)

4 Installation

4.1 Transportation

The installation consists – depending on the design – of one or two modules, which can be transported separate from each other. The transportation will be done on pallets. For the handling two persons are needed.

4.2 Storage

If the installation shall be stored, the control part must be protected against heat and humidity. In order to avoid condensation of water the installation must not be exposed to high temperature changes, otherwise the installation must be exposed to the new ambient temperature with flaps open for several hours prior to operation.

The material component is extensively resistant against external influence, however, for a longer period of storage it should be filled with preservative oil in order to take care of the packings and to guarantee proper operation.

Operate the supply pumps according to the relevant service manuals of the pumps.

4.3 Installation

Generally the industrial installations of Finishing Brands will be installed by own service technicians or service technicians of our representative. This is to avoid faults at the very beginning caused by defective installation or operation.

If installation shall not be made by an Finishing Brands service technician, check the completeness and the correct function of all components of the scope of delivery.

For installation always take care of the usability of the installation, the ambient conditions (e.g. EEx explosion proof), and the safety of the operator.

WARNING: the control cabinet cannot be located in the EEx area. If operation in the EEx area is necessary, a remote control panel is optionally available.

4.4 Electrical Connections

The installation will be supplied via a central electrical input at the control cabinet. Pay attention to proper grounding of the necessary shock-proof plug. In the basic version the fluid cabinet (material component) and the electrical cabinet will be delivered separately. The connection of the two parts will be carried out according to the description under Pos. 10.2 (Connect Material Component and Electrical Cabinet).

4.5 Pneumatic Connections

The installation (in standard version) will be supplied via a central air connection. The pressure must be at least 6 bar and must not exceed 8 bar! Please provide clean industrial air and proper filtration and condensate separator. Use oil-free pressure air.

4.6 Material Connections

The material component must be supplied with at least – depending on the number of components – one main color, one hardener and one flushing agent. The outlet of the static mixer must be connected to the gun/the guns with a suitable fluid hose (please refer to length and nominal pressure).

The hoses must be equipped with adequate hose connections according to the installation. The threads must be in proper condition and must seal under pressurized condition.

5 Operation of the Installation

5.1 General

5.1.1 Turn on the Installation

Turn on the installation by turning the main switch into position „ON“. Only turn the installation on if the control cabinet is closed (high voltage). Opening of the control cabinet at ON condition must only be done by qualified personnel and a service technician.

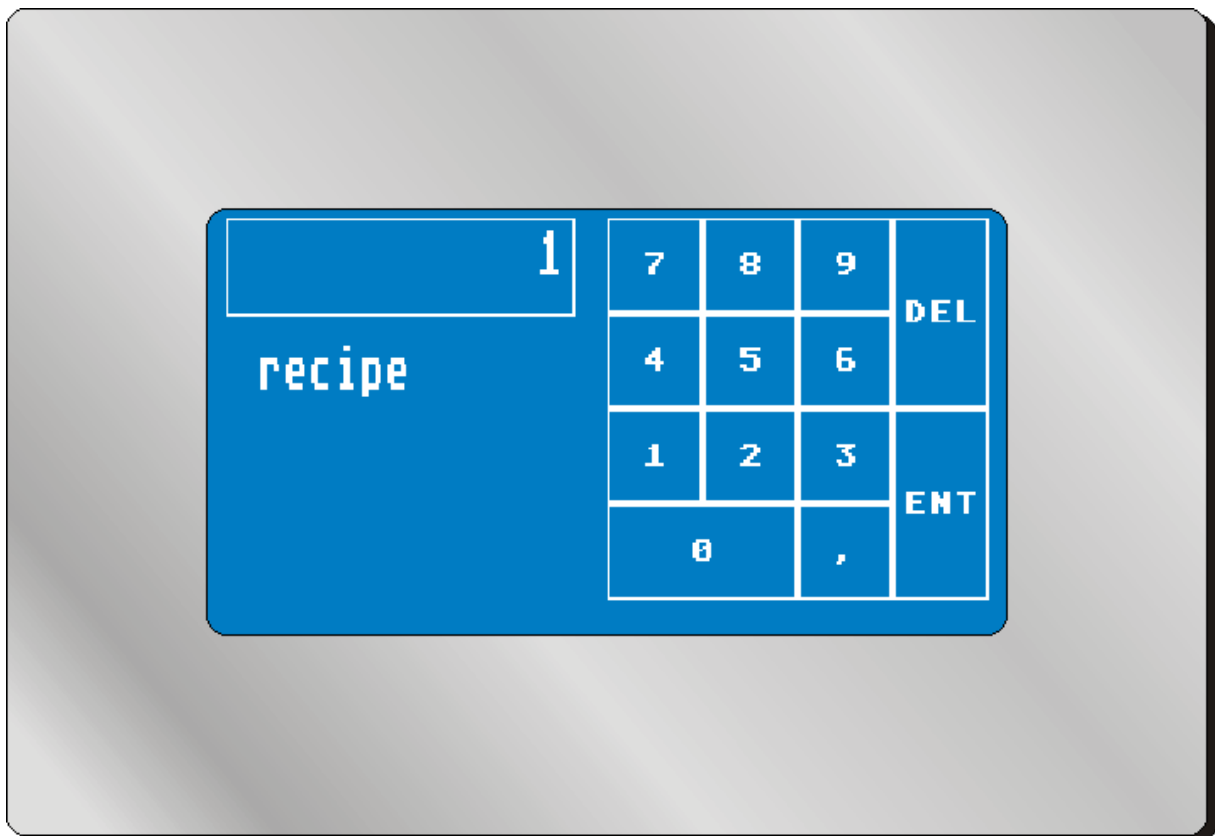
Generally it is not necessary to turn off the installation. If the installation is in the main menu and has been cleaned, the screen will independently turn off after an adjustable period of time (see system settings, value „Standby“).

Do not turn off the installation in filled condition, control of the pot life will than no longer be possible, resulting in the danger of material hardening in the installation.

5.1.2 Input of Numbers

To set the different parameters it is necessary to be able to enter numbers.

Generally this will be done by the input field shown below:

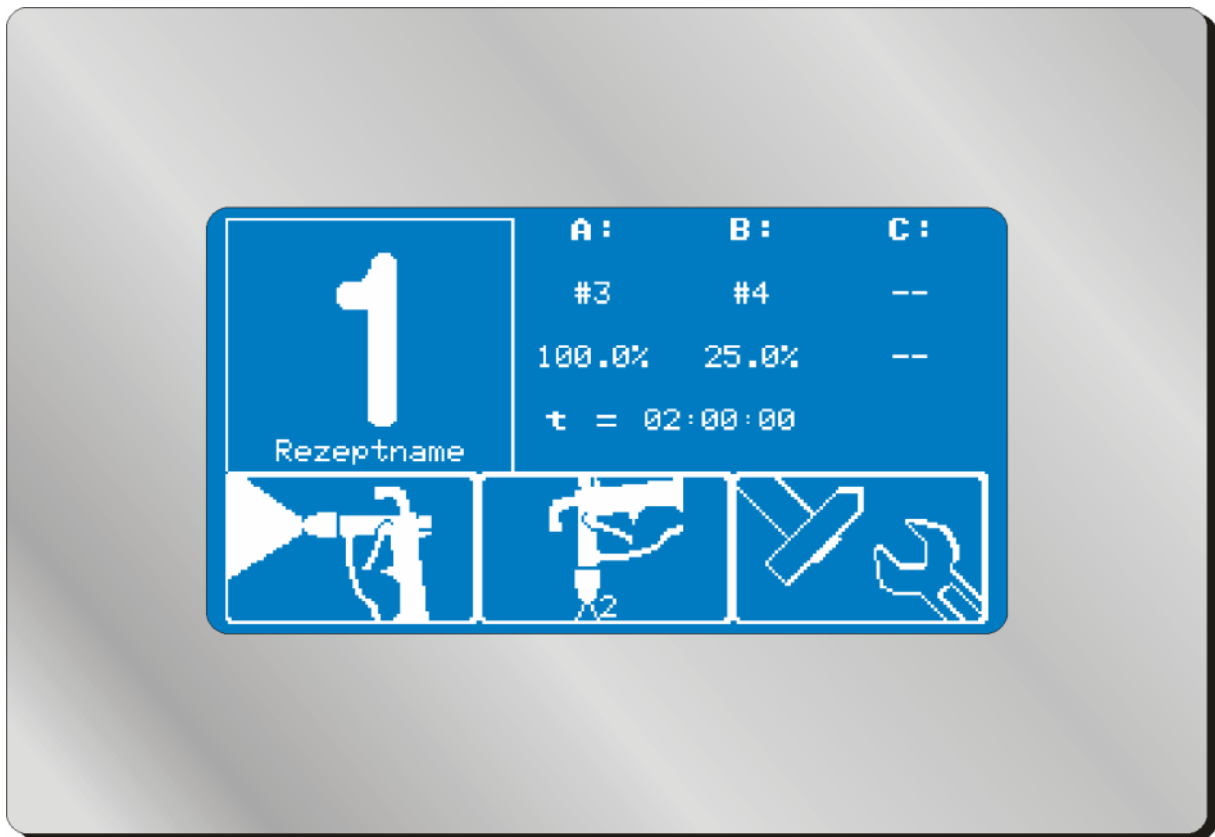


The value to be set is shown at the upper part on the left side. The value will be deleted by pressing the „DEL“ key (one decimal place each per key depression). The value will be entered into the system by pressing the number fields and by pressing the field „ENT“.

The name of the value (here „recipe“, i.e. recipe number), is described below the value.

5.2 Main Menu

5.2.1 Select Recipe



By pressing the recipe number (here „1“) you are asked to enter a new recipe number. Possible inputs are all recipe numbers from 1 to 50.

Below the recipe number, the name of the recipe will be displayed. On the icon „Flushing“, the number of the stored flushing program (1-10) for this recipe will be displayed.

If you have chosen a recipe number, which has been deposited in the recipe administration as an inactive one, the display with the recipe parameters will flash. You cannot start this recipe.



5.2.2 Start Spraying Procedure -

Press the spray icon – The icon activates the mixing procedure, provided that an active recipe was chosen before.



5.2.3 Start Flushing Procedure -

Press the flushing icon - The icon will activate the flushing procedure. The flushing procedure may be repeated as often as you wish (for example if several spray guns are connected, which shall be cleaned one after the other). If the icon flashes, the

installation has not yet been cleaned after the last mixing procedure and the remaining pot life will still be counted down.

The pot life will only be reset to the start value after a COMPLETELY PERFORMED flushing procedure!

The flushing program that was activated during the last mixing procedure will be selected by default. Therefore, it is not important which flushing program number is displayed on the icon but which recipe was started and stopped last.

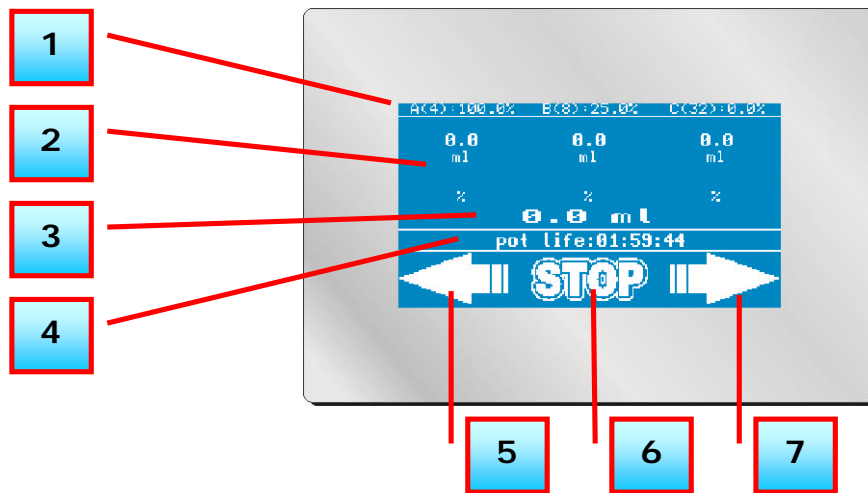
5.2.4 Adjust Settings -



This icon will lead you to the system settings. Here you can change for example recipes, operating parameters and safety settings. According to the setting the different sections may eventually only be entered via passwords.

5.3 Painting / Mixing

During the mixing procedure, four different displays can be selected. By using the arrow keys on the bottom of the screen, you can change between the displays.



[1] On top of the screen (on all displays), the set value of the mixture ratio and the selected valves will be displayed.

[2] Below, you can read the actual values. The measured value for each component is displayed in milliliters and in percent.

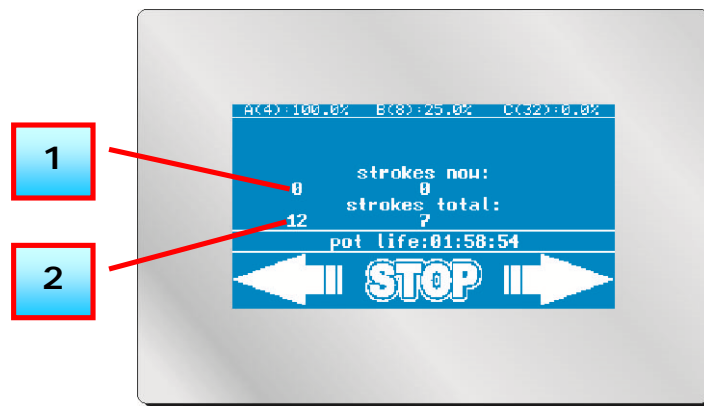
[3] At this position, you can read the total consumption. This is important for, e.g., the filling quantity of the system or the resetting of the pot life.

[4] Remaining pot life. The basic pot life will be stored in the recipe. If not enough material is extracted, the pot life will run towards 00:00:00 and will subsequently set off an alarm. If the alarm is not acknowledged in time (within 5 minutes), an automatic flushing procedure will be started. **IMPORTANT:** In order to reset the pot life automatically, double the amount of the paint filling quantity has to be extracted from the system in order to ensure a complete exchange of the material. Example: If the filling quantity is determined at 200 ml and stored on the system (system settings), the pot life will be reset to the initial value after the removal of 400 ml, respectively.

[5] Using the arrow key, will take you to the previous display.

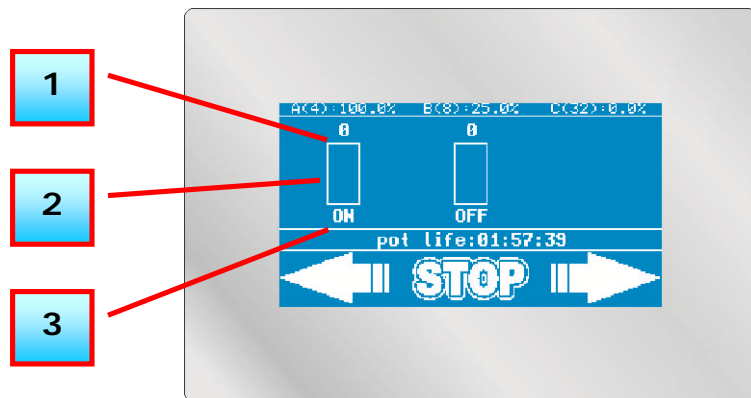
[6] By pressing the „Stop“ key, the mixing procedure will be stopped.

[7] Using the arrow key will take you to the next display.



[1] „strokes now“ = the total number of strokes of the material valves in this recipe since the start of the mixing procedure. The main component stays at „0“ because the valve will only be opened at the start and closed at the end. The number of strokes per volume provides information about the quality of the dosing. Many small hardener injections result in a better mixing result than a few large injections.

[2] „strokes total“ = the total number of strokes since the installation. This can be helpful for the servicing of the valve. Based on experience gained during the operation of the system, you can draw conclusions on the actual condition of the wearing parts on the valve.

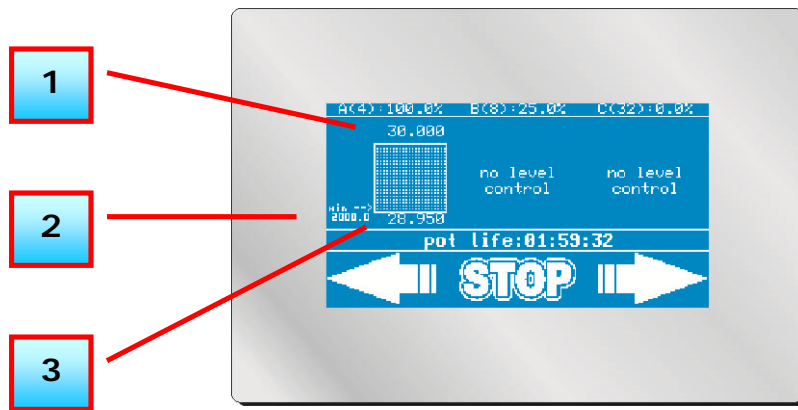


[1] Monitoring of the gun: The number on the display indicates the time in seconds during which the gun has been open, however, did not receive any impulses of the metering cell. As soon as the volume sensor is measuring a material flow, the value drops back to „0“. If the value increases up to the stored value for the monitoring of the gun, the system will set off an alarm. The monitoring of the gun is performed via a sensor in the atomizer air. For automatic guns, the monitoring is performed via a potential-free contact, which is closed by the higher-level SPS.

[2] Volume flow: The bar displays the output frequency of the volume sensor. It is proportionally to the measured volume flow.

[3] Valve status: When the valve is activated, „ON“ will be displayed on the screen, otherwise „OFF“. The main component is permanently open.

By means of this display, hardware errors can be detected easily. If, for example, the valve is „ON“ but the value of the gun monitoring is increasing steadily, then the cause will be that no material is flowing or the metering cell is blocked or the flow sensor for the atomizer air is set incorrectly.



[1] Tank size: The value displays the capacity size, indicated in liters, for this container.

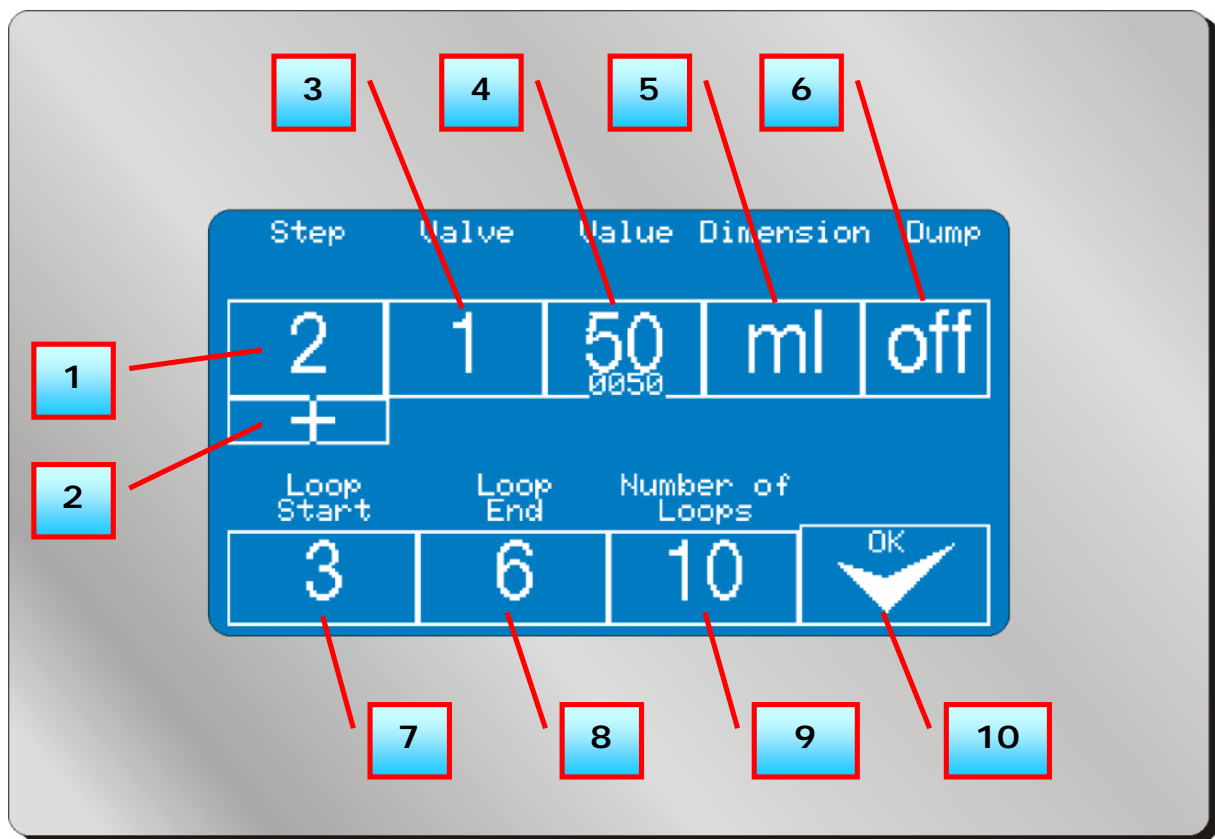
[2] Minimum level: The programmed value displays from which tank level the alarm output will be switched on.

[3] Level indicator: The value displays the actual material quantity in the tank.

„No level control“: The tank has not been activated for tank monitoring.

Up to 8 tanks can be monitored with their own alarm output via the optionally available „Standard Level“ output module. By this means, for example, eight alarm lights can be activated individually in order to see immediately which tank has to be refilled.

5.4 Flushing



[1] Actual flushing step: A flushing procedure may consist of up to 20 different steps. All flushing steps, for which values are deposited, will be run in numerical order.

[2] To skip one flushing step: If the actual flushing step shall be skipped, press the key and skip to the next flushing step, for which values are deposited.

[3] Valve number: The actually opened flushing valve is displayed.

[4] Flushing value: deposited set value of the flushing program, alternatively in „ml“ or in „sec“ (see [5]).


[5] Dimension: Displays whether the actual flushing step will be done in milliliters or in seconds. Fundamentally the cleaning of the installation in milliliters is process safer. However, a quantity collection is not sensible for steps, which cause an air / solvent flushing. Therefore, the dimension can be determined for each flushing step separately (see flushing programming).

[6] Dump valve: It is possible to deposit for each step in the flushing program, whether the signal „Dump Valve“ shall be activated. This signal can then be used to activate a gun cleaning box, or whether the cleaning shall be carried out via an external dump valve.

[7] Begin loop: If a loop was programmed in the flushing program, which in wraparound manner carries out certain steps for a certain number of repeat options, then the first flushing step of this loop can be displayed here.

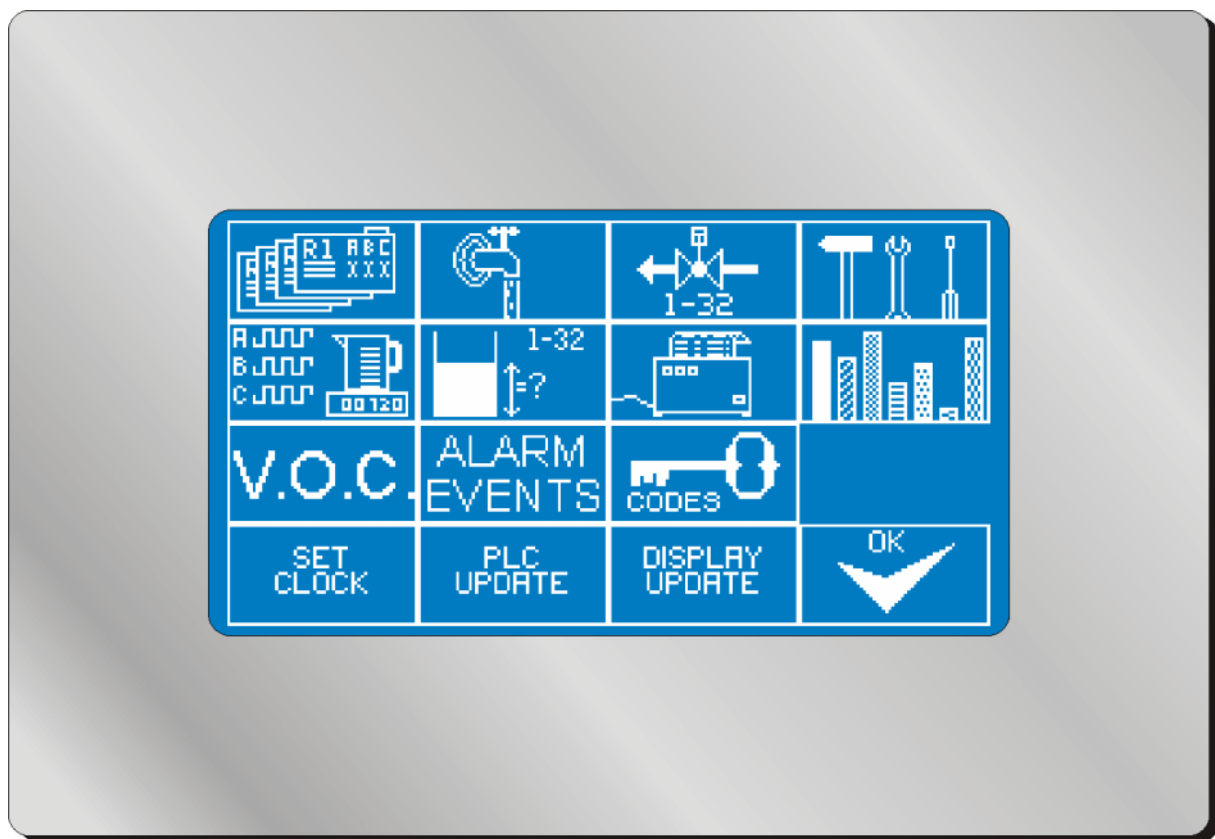
[8] Last step of the loop described under [7].

[9] Number of loop running (see [7]).

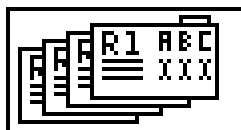
[10]  - This key will truncate the flushing procedure and will close all valves.
WARNING: If the flushing procedure will be truncated, the installation is still regarded to be filled. The pot life is, therefore, still running!

For the refilling and flushing of several guns, an output module is available. You can connect up to 4 dump valves or gun extractor units. If the system recognizes this module during the switch-on, the operator will be prompted during the start-up of the spraying process to enter the spray guns that should be activated. When the system will be flushed at a later stage, the entered flushing procedure will run once for every previously filled gun. During each run, another extractor unit will be activated in order to ensure that every gun is flushed properly.

5.5 Settings



In the Tool Menu all installation parameters can be set. All settings can influence the mixture result and should, therefore, only be carried out by trained personnel or by service technicians! There is also the possibility to protect all sub-menus by passwords and to inform only selected persons (see „Codes“).



5.5.1 Recipes

Press the recipe key in order to enter the recipe administration (if necessary enter security code):

A:		B:		C:	
#4		#8		--	
100.00%		25.00%		--	

t(min) 120	p(bar) 2.00	Flush 1	Active Y		
---------------	----------------	------------	-------------	--	--

Press the key for the **recipe number**, on top left, to select the recipe to be modified.

In the centre of the screen, you can choose any name for the recipe with up to 15 characters. This name will be displayed in the main menu under the recipe number. This will make it easier for you to assign the recipes to the connected colors.

Use the chart, on top right: For the selected recipe a **material valve** can be allocated to each metering channel (A / B / C), and the **material portion** for the recipe can be determined. Please note that the **volumetric** mixture ratio will be entered. It is of no importance whether, for example, for „A“ 4 portions and for „B“ 1 portion are entered, or whether the mixture ratio will be entered as 100 : 25. During the mixing procedure the main component will automatically be determined by the greatest portion of the total mixture and permanently opened, while the other components will be metered on.

Only enter values under „C“, if the installation is equipped as **3C installation**.

Ensure that the entered valve numbers are really connected to the relevant metering cells.

Adjust the pot life of the relevant mixture under **t(min)** (in minutes).

If an automatic pressure adjustment kit (optional) is connected to the installation, you can determine the fluid pressure under **p(bar)**, which will be adjusted after filling.

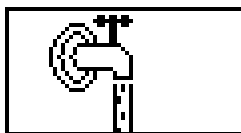
Under **Flush**, enter the flushing program that should be assigned to this recipe. You can select one of the ten flushing programs that you set up earlier.

Under **Active** you can determine whether it is an active recipe that can be started immediately. You can release recipes to the operator or close them off. Inactive recipes will flash when they are selected in the main menu and cannot be used.

The icon with the crossed out disk rejects all modifications and loads down again all 50 recipes from the system memory.

The icon with the disk stores all modifications and will lead you back to the tool menu.

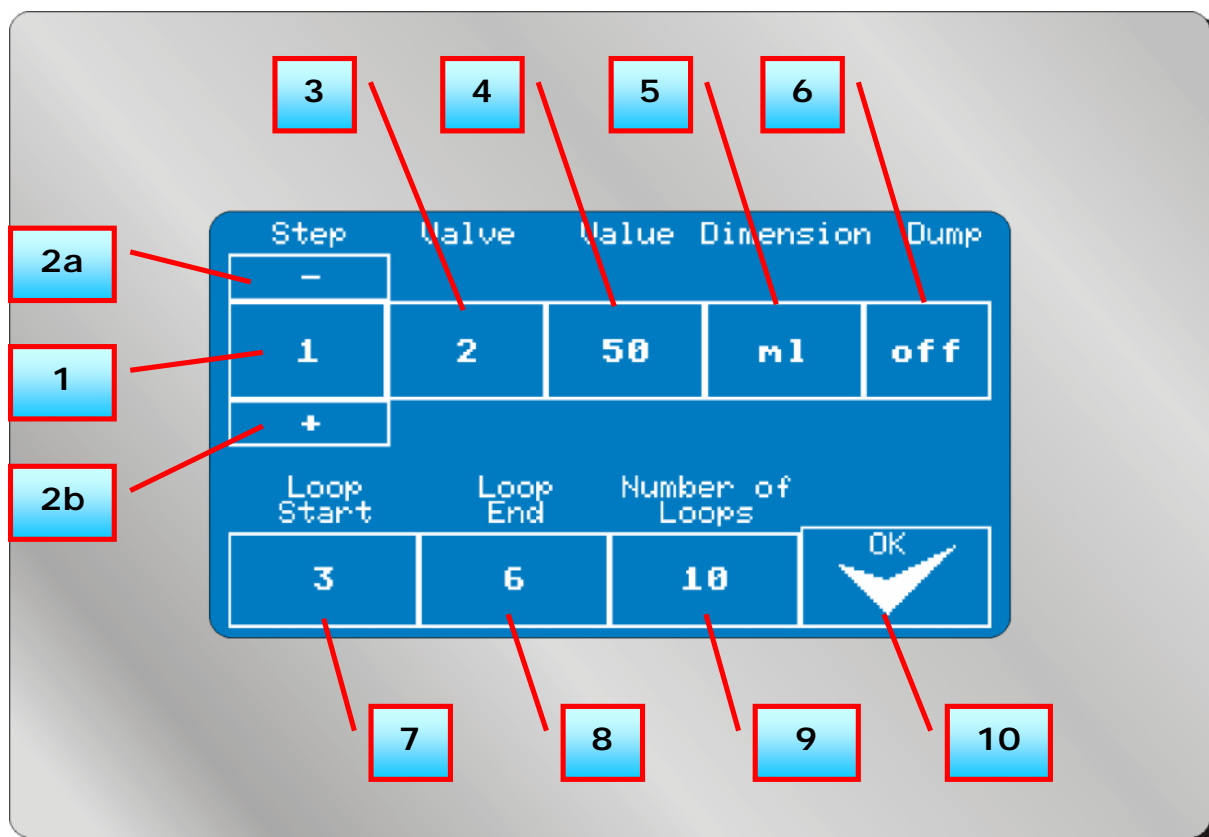
ATTENTION: During the cancelling or saving process, the control unit requires a few seconds either in order to write the data of 50 recipes to the EEprom or to read them on the EEprom. For this reason, do not try, **UNDER ANY CIRCUMSTANCES**, to speed up this process by pressing especially hard on the display!



5.5.2 Administration of Flushing

Press the flushing program key in order to enter the administration of flushing (if necessary enter security code):

First, you are asked to enter the number of the flushing program that you wish to edit. You can enter the numbers 1 to 10.



[1] Actual flushing step which is being processed: A flushing procedure may consist of up to 20 different steps. Only those flushing steps will run in numerical order where values are deposited.

[2a] / [2b] Flushing step advance, flushing step return: changes to previous, respectively next flushing step which shall be processed.

[3] Valve number: Number of the flushing valve which shall be opened in this step.

[4] Flushing value: set point value of this step which must run so that the installation skips to the next step, alternatively in „ml“ or in „sec“ (see [5]).


[5] Dimension: Displays whether the actual flushing step will be done in milliliters or in seconds. Fundamentally the cleaning of the installation in milliliters is process safer. However, a quantity collection is not sensible for steps which cause an air / solvent flushing. Therefore, the dimension can be determined for each flushing step separately.

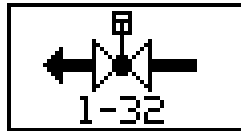
[6] Dump valve: It is possible to deposit for each step in the flushing program, whether the signal „Dump Valve“ shall be activated. The signal can then be used to activate a gun cleaning box, or whether the cleaning shall be carried out via an external dump valve.

[7] Begin: in the flushing program a loop can be programmed, which in wraparound manner carries out certain steps for a certain number of repeat options. Here the first step of this loop will be displayed.

[8] Last step of the loop described under [7].

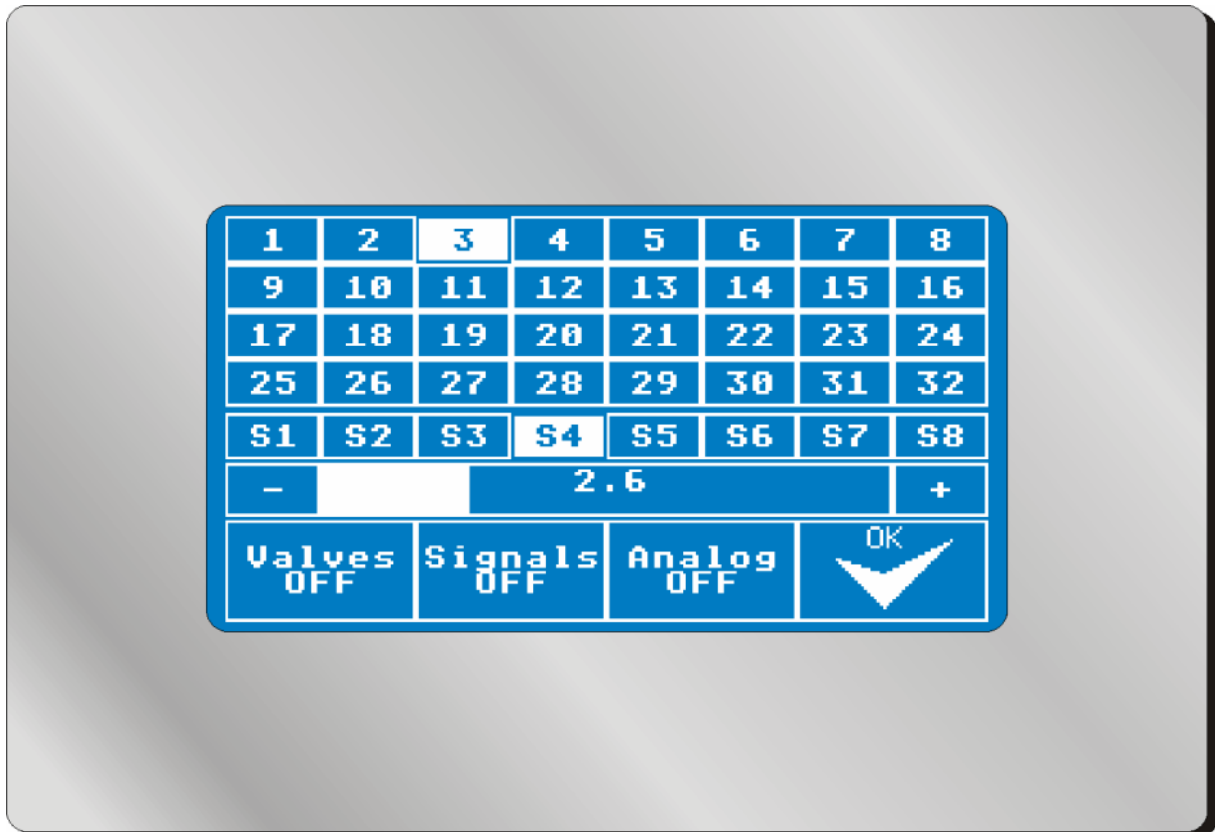
[9] Number of loop running (see [7]).

[10]  - Key to store all modifications.



5.5.3 Valves

Press the valve key in order to enter the manual control panel for the connected valves, signal outputs (optional), and pressure regulator (optional):



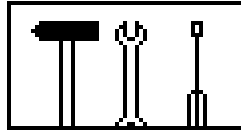
The keys 1 – 32 control the relevant valves. For security reason one fluid valve only can be opened at the same time. If you want to close all valves again, press the key „Valves OFF“.

The keys „S1“ – „S8“ control the special signals (output board with 8 power outputs in 24VDC optionally available):

- S1: Mixing OK
- S2: Ready
- S3: Flushing
- S4: Filling
- S5: Dump Valve
- S6: Filled
- S7: Alarm
- S8: HiFlow

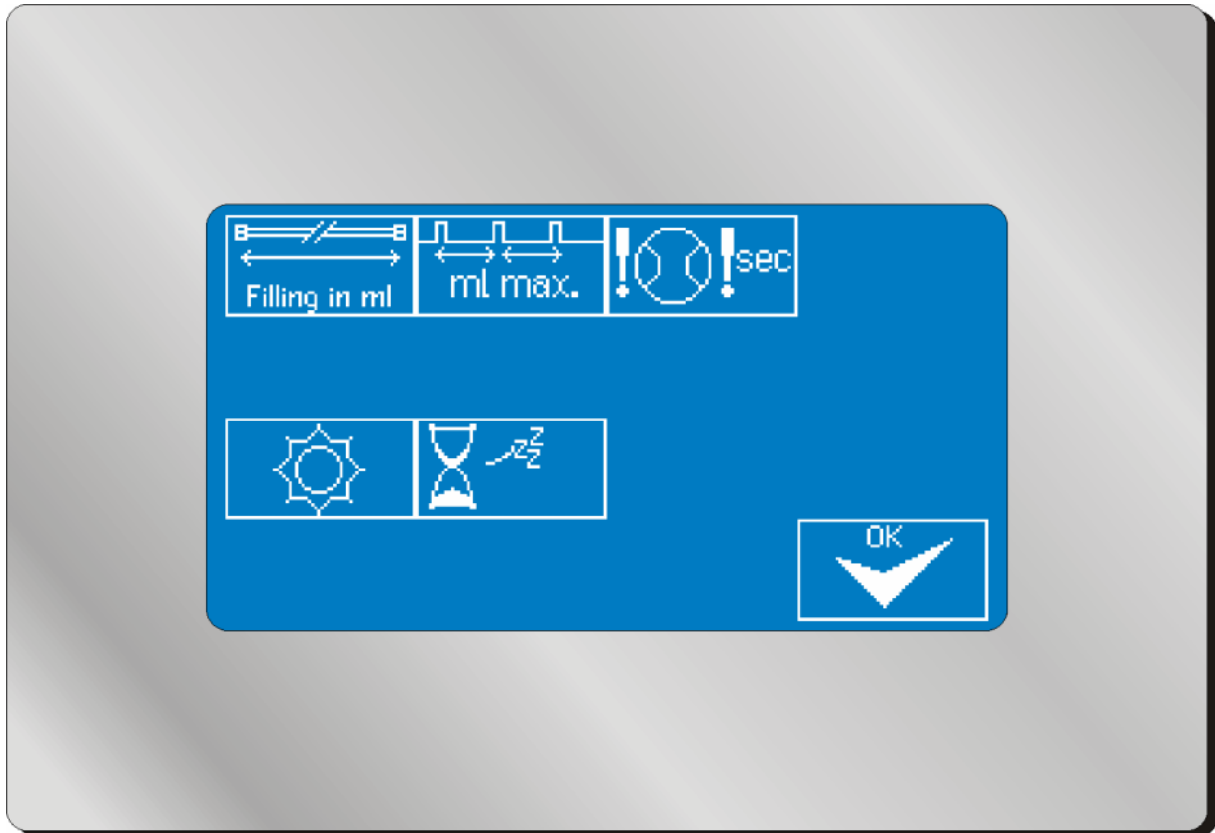
Press the key “Signals OFF” to turn off all outputs.

You can test the optionally available pressure adjustment kit with the analogue regulator. With „-“, you will reduce the value by 0,1 bar, with „+“ you will increase the value by 0,1 bar. With „Analogue OFF“ you will reset the value to 0,0 bar.

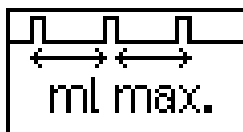


5.5.4 System Settings

In system settings important and security relating settings for the operation of the installation can be entered. The correct setting of these parameters is of great importance to the finish result and the trouble free operation of the installation.



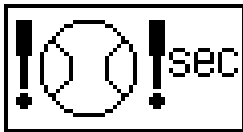
Filling Quantity: On the one hand the filling quantity is important for the external signal „Filling“ to which, for example, a signal light can be connected which indicates the operator that the filling procedure has not been finished. On the other hand the filling quantity is needed to control the pot life. After removal of **twice as much filling quantity** the pot life will be reset to start value. Removal of twice as much filling quantity is necessary in order to prevent mixing of already reacting and fresh material in the installation and in the hoses.



Incremental Size: The incremental size is necessary to control the accurate mixing of the materials. The deposited value indicates the maximum interval between two hardener metering injections in milliliters. **Important:** this value has no influence on the quality of mixing! It only serves the control function. The installation itself tries to meter the hardener in smallest possible injections. The cycle frequency

of the valve depends on overpressure of the hardener, needle stroke of the metering valve, flow rate, viscosity and many others.

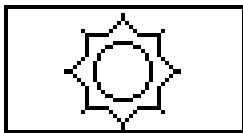
Generally the incremental size should be adjusted in such a way that mixing of the material in the mixer can just be carried out. An incremental size of 100 ml for a static mixer with filling volume of 20 ml may have the result that the material will not be mixed accurately, but that the installation still operates without error signal.



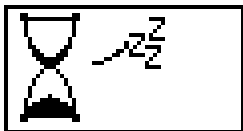
Metering Cell Control: The indicated value indicates how long the spray gun may be opened without the metering cell having to move. The control of the gun opening in manual installations is generally carried out by the air flow control integrated into the atomizing air. For automatic installations this signal can directly be given by an external control.

When the painter opens the gun, the material flow should start shortly afterwards and activate the gear wheels of the metering sensors. As long as a movement will be recognized and impulses of the metering cells to the control of the mixing installation are given, the control of the metering cells will be reset. If, however, a metering cell is blocked because of contamination, so that it cannot recognize a volume flow, the installation will give an alarm signal after the here deposited time.

The time should be in the range of 5-10 seconds in order to guarantee that no unmixed material can escape the gun. However, the time should not be chosen too short (less than 3 seconds) since the painter is using the gun sometimes to blow dust from the object.

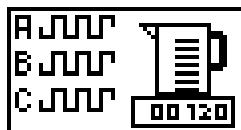


Display Brightness: Enter the value for the relative display brightness in percent (0- 100%). Attention: If the value is too low you might not be able to read the displays and will then not be able to increase the value!



Standby Time: The standby time in seconds indicates after which time period the display turns off for longer service life of the lightning cathode. The installation only switches to standby mode if it is flushed and if it is in the main menu (all valves closed).

If the installation is in standby mode it is sufficient to touch the screen to return into the main menu.




5.5.5 Calibrate / Adjust K- Factors



5.5.5.1 K- Manual Adjustment of K-Factors


For quick operation of the installation and for the general control of functions it is generally sufficient, to enter into the system the construction wise given K-factors of the volumeter. They are generally entered when the installation is supplied.

To take account of the different physical characteristics of the fluid to be metered, an own K-factor can be entered for each valve and for each connected fluid. At the same volumeter a highly viscose solvent based paint will cause another K-factor than a cleaning thinner or a water based paint.

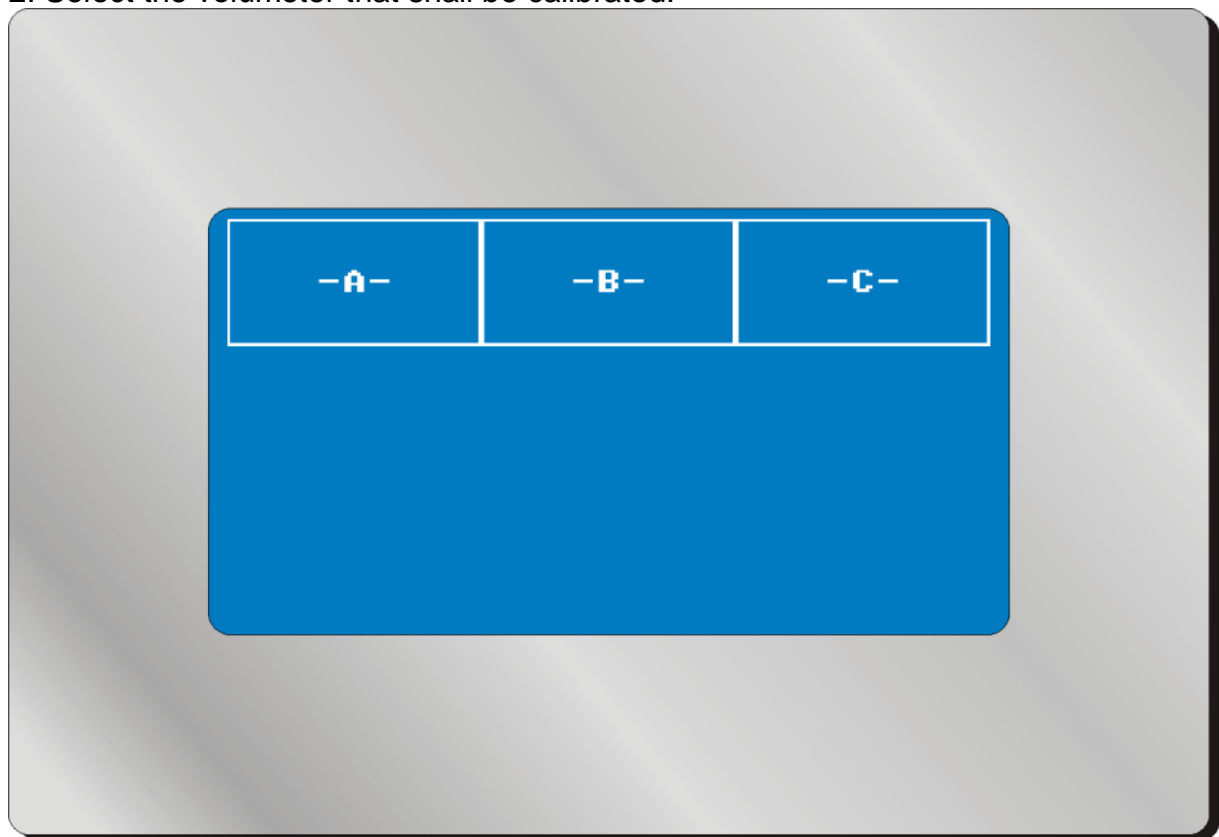
Press the single number fields (1 – 32) to read the deposited value. If you wish to change this value (e.g. after retrofit to another volumeter), you can do this by pressing the number input icon. ()

5.5.5.2 K- Determine K-Factors

To increase the accuracy of the mixing installation it is recommendable to calibrate all fluids. Follow the steps hereafter:

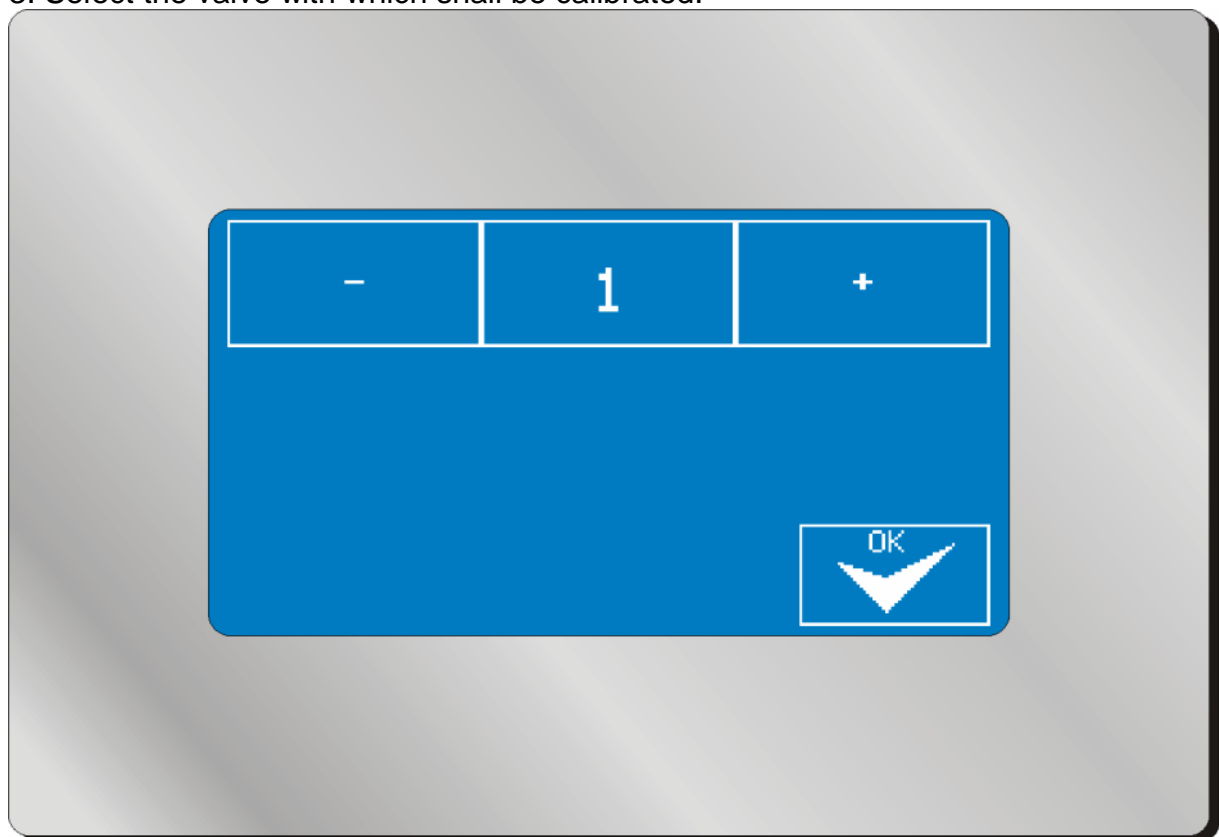
1. Press the icon with the mixing cup ()

2. Select the volumeter that shall be calibrated:



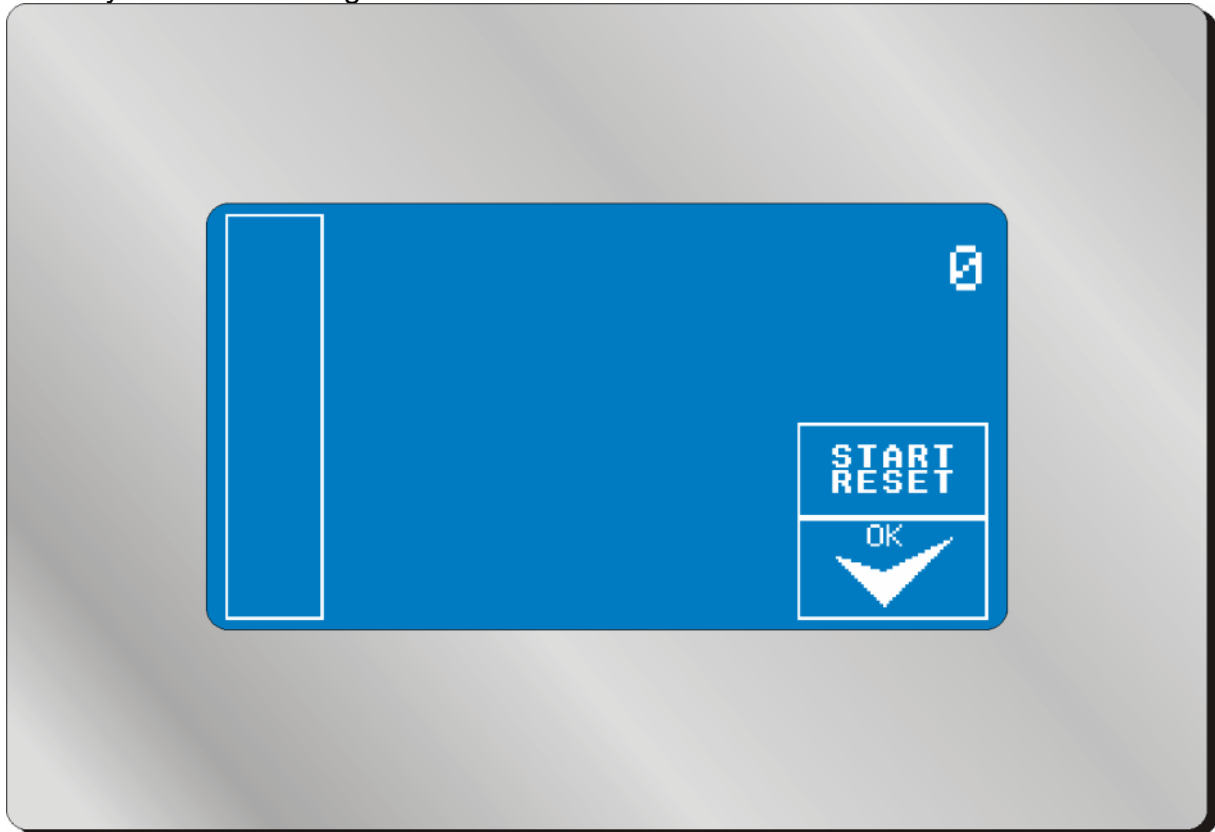
A screenshot of a calibration selection screen. The screen has a light gray background with a dark gray border. In the center, there is a blue rectangular area. At the top of this blue area, there are three white rectangular buttons arranged horizontally. The first button contains the text "-A-", the second button contains the text "-B-", and the third button contains the text "-C-". Below these buttons is a large, empty blue rectangular area.

3. Select the valve with which shall be calibrated:

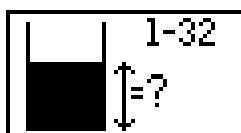


A screenshot of a valve selection screen. The screen has a light gray background with a dark gray border. In the center, there is a blue rectangular area. At the top of this blue area, there are three white rectangular buttons arranged horizontally. The first button contains the text "-", the second button contains the text "1", and the third button contains the text "+". Below these buttons is a large, empty blue rectangular area. In the bottom right corner of this blue area, there is a white rectangular button containing the text "OK" and a white downward-pointing arrow.

4. Carry out the metering:



- The bar on the left side indicates the flow rate. If the bar does not deflect upwards when removing material, you have either selected a valve which is not allocated to the selected volumeter, or the metering cell is mechanically blocked.
- The number on top right indicates the count of impulses. Open the spray gun at first and remove material. The count-up counter must now display an increasing value.
- With the „START / RESET“- key you can reset the count-up counter to Zero. Press the key after having filled the system with material, wait for some seconds and start the actual metering.
- Remove a well readable quantity of material into a metering cup. Close the spray gun and wait for some seconds until the count-up counter has come to standstill.
- Finally press the „OK“- key. You will then be asked to enter the volume of the removed material.
- The resulting K-factor will be displayed and will then be entered into the system.



5.5.6 Container Control

1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	32

MAX LEVEL	30000ml	No. 1	Active
ACTUAL CONTENT	13250ml		OK ↓
MIN LEVEL	2000ml		

The integrated container control serves the control of the container level without additional sensory mechanism. If a container shall be controlled it is necessary to deposit into the menu its level prior to use.

Starting from the metered consumed material quantity the system can give an alarm signal if a defined minimum level is reached, in order to avoid no-load operation of the pumps with the result of defective mixtures and failures.

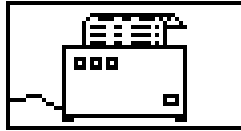
With the buttons [1] – [32] the container will be selected which shall be adjusted or controlled.

With the button [MAX LEVEL] the size of the container will be determined, which it had when delivered.

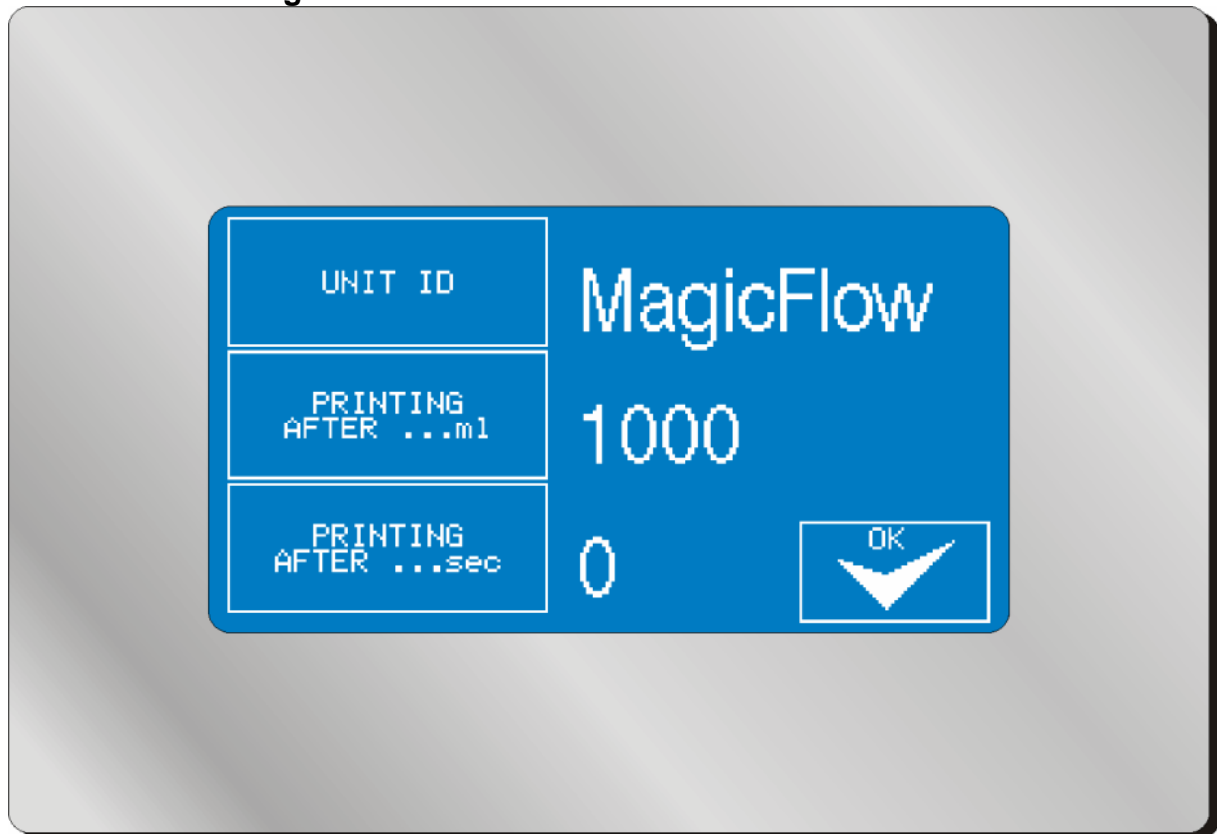
[ACTUAL CONTENT] displays the actual container level. Press the button to refill the container numerically or to enter any new level.

[MIN LEVEL] displays the minimum level. An alarm signal will be given if the level falls under this value. Press the button to adjust the level.

[ACTIVE] resp. [NOT ACTIVE] will display whether the control shall be activated. If the button is in [ACTIVE] mode, an alarm signal will be given. If the button is in [NOT ACTIVE] mode, the container level will be calculated, but the minimum level will be ignored.



5.5.7 Printer Configuration



[UNIT ID] displays the name of the mixing installation which appears on the prints. It is therefore possible to distinguish between the prints of different installations. The name can have up to 10 characters.

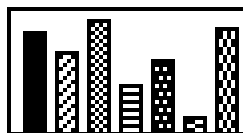
[PRINTING AFTER ...ml] displays in which intervals process information shall be printed. In the above shown case a print would be started after every removal of one liter material.

[PRINTING AFTER ...sec] displays the intervals during the mixing procedure when prints shall be printed.

It is possible to activate the two print variants, but also only one or none of them. If you do not wish to have prints made, set the values to „0“.

Set the following parameters on the printer interface that is provided as standard (serial):

Baud: 9600 (8 bit / no parity / 1 stop bit), no hardware handshake



5.5.8 Reports

1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	32

TOTAL		VOC=	0ml 0ml	No.
JOB	RESET JOB	VOC=	0ml 0ml	02
PRINT ALL		<div>OK</div>		

Use the keys [1] to [32] to select the valve, respectively the component where you wish to read the consumption.

[TOTAL] displays the total consumption of the component since installation of the system. It is not possible to reset this value.

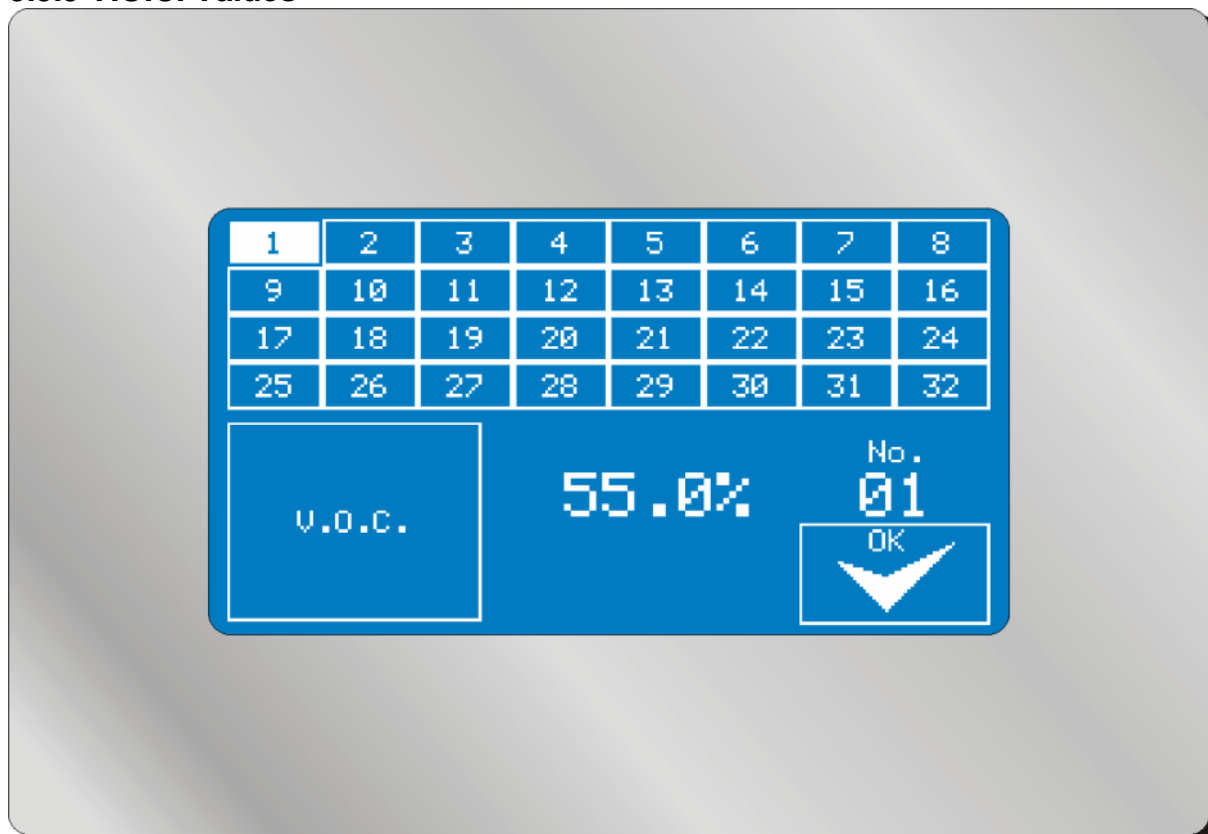
[JOB] displays the consumption since the last reset of this value. It is, therefore, possible to collect the weekly consumption, for example. The operator can reset this value with the key [RESET JOB].

As well as at the count of total consumption, as at the job count the consumption of the component is listed and its VOC content. The relative VOC content in percent can be set in the VOC Menu (see 5.5.9).

Press the key [PRINT ALL] in order to print the consumption value of all components, as far as the optionally available printer is connected.

V.O.C.

5.5.9 V.O.C. Values

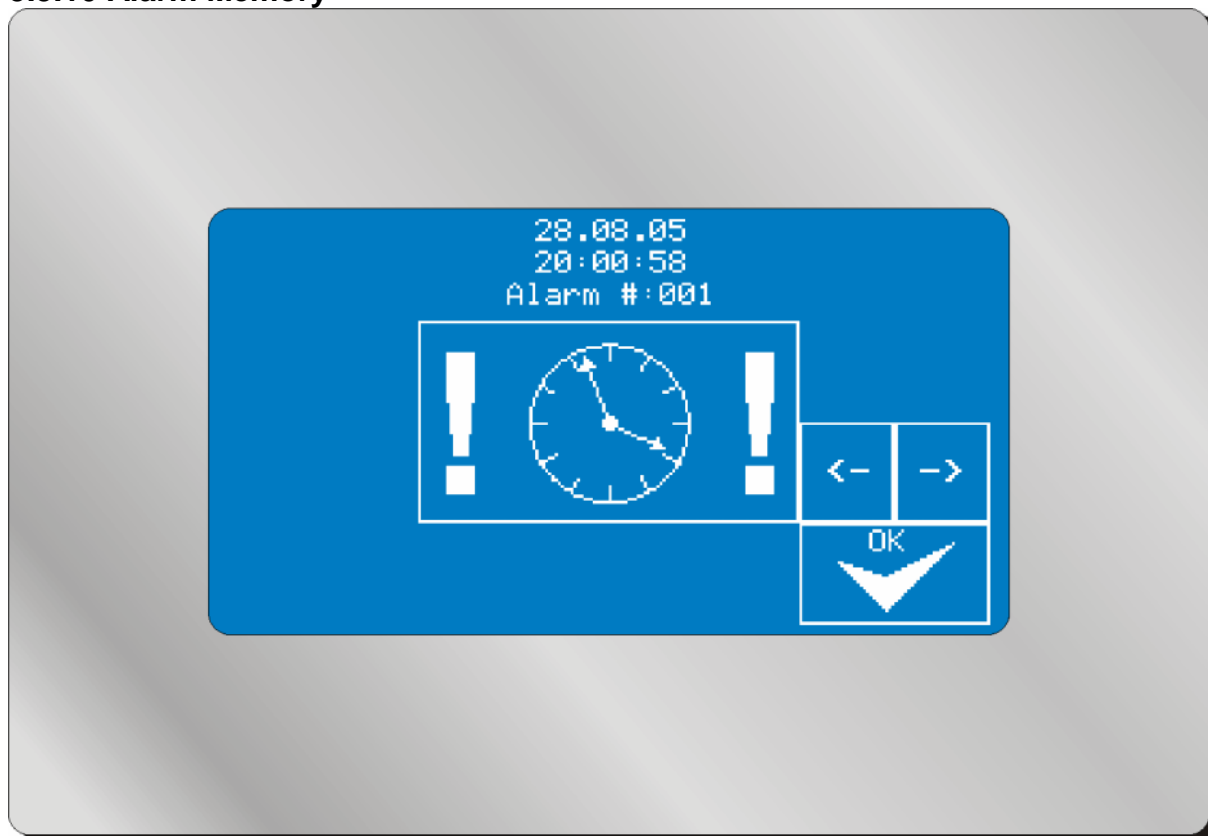


Press the keys [1] to [32] to select the valve, respectively the component where you wish to adjust the VOC value.

The VOC value (in %) will be displayed in the mid. Press the key [V.O.C.] to adjust the value for each valve separately. The value is needed in order to calculate for the consumption reports not only the consumption but also the VOC emission.

ALARM EVENTS

5.5.10 Alarm Memory



The mixing installation stores up to 100 alarm messages in sequence of appearance. You can scroll through the alarm history with the keys [←] and [→]. If more than 100 errors were collected, the last 100 messages are still available. Each alarm message is listed with date and time as well as with the reason for the alarm.

The significance of the alarm icons you will find in the Chapter „Alarm Messages“.



5.5.11 Security Codes

When delivered all menus are accessible without code input. (Input „0“). After installation and initial operation all security relating settings should be secured against unauthorized access.

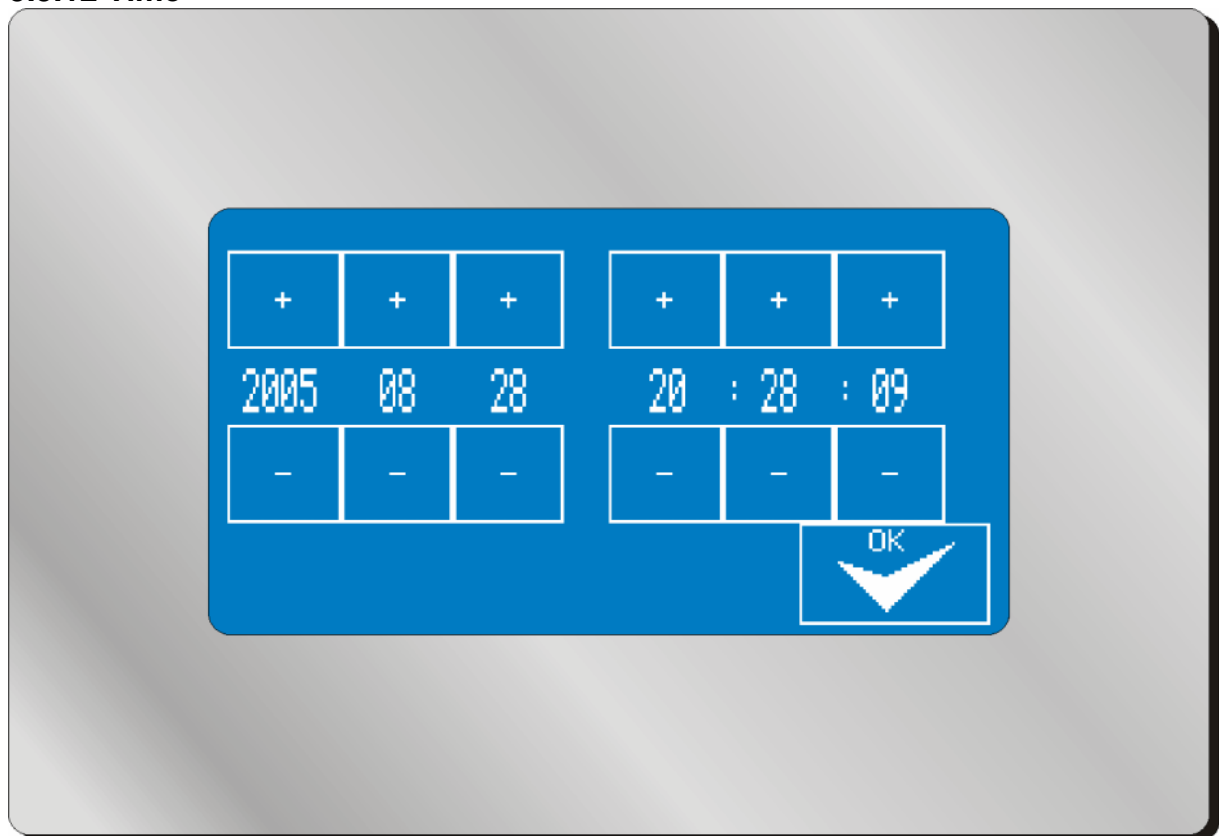
The setting of the passwords will be done in the same manner as an eventually later necessary adjustment of the codes.

To set a code you press the above shown key icon. You will be asked to enter the “master code” which for reasons of security is not part of this documentation. It will be sent separately to you from Finishing Brands / Binks. After input of the code you press the field the menu of which you want to secure with a new password. You will see the input picture „new code“. Enter here your new secret number. The code will automatically be stored.

If you should forget or mislay your access code you can also use this procedure in order to find out the deposited code. But carefully keep the master code because it is an unchangeable part of the software of the control.

SET
CLOCK

5.5.12 Time



Press the key [SET CLOCK] in order to set the internal clock of the installation. The clock has a movement reserve of approximately 10-14 days. The clock is necessary to print reports and for storing alarm messages.

To change values you press the keys [+] / [-]. To store the modifications you press the key [OK].

A rectangular button with a black border containing the text "PLC UPDATE" in a bold, sans-serif font, arranged in two lines.

5.5.13 PLC Update (Software- Update)

The PLC should receive new updates in exceptional cases only, and only by authorized and qualified personnel. However, should you press this key, the installation switches into the so called „HOST Mode“, in which it is ready to receive new software. You can only return from this mode to the normal operating mode by turning off the power supply or by pressing the “Reset” key on the PLC main board.

A rectangular button with a black border containing the text "DISPLAY UPDATE" in a bold, sans-serif font, arranged in two lines.

5.5.14 Display Update (Software- Update)

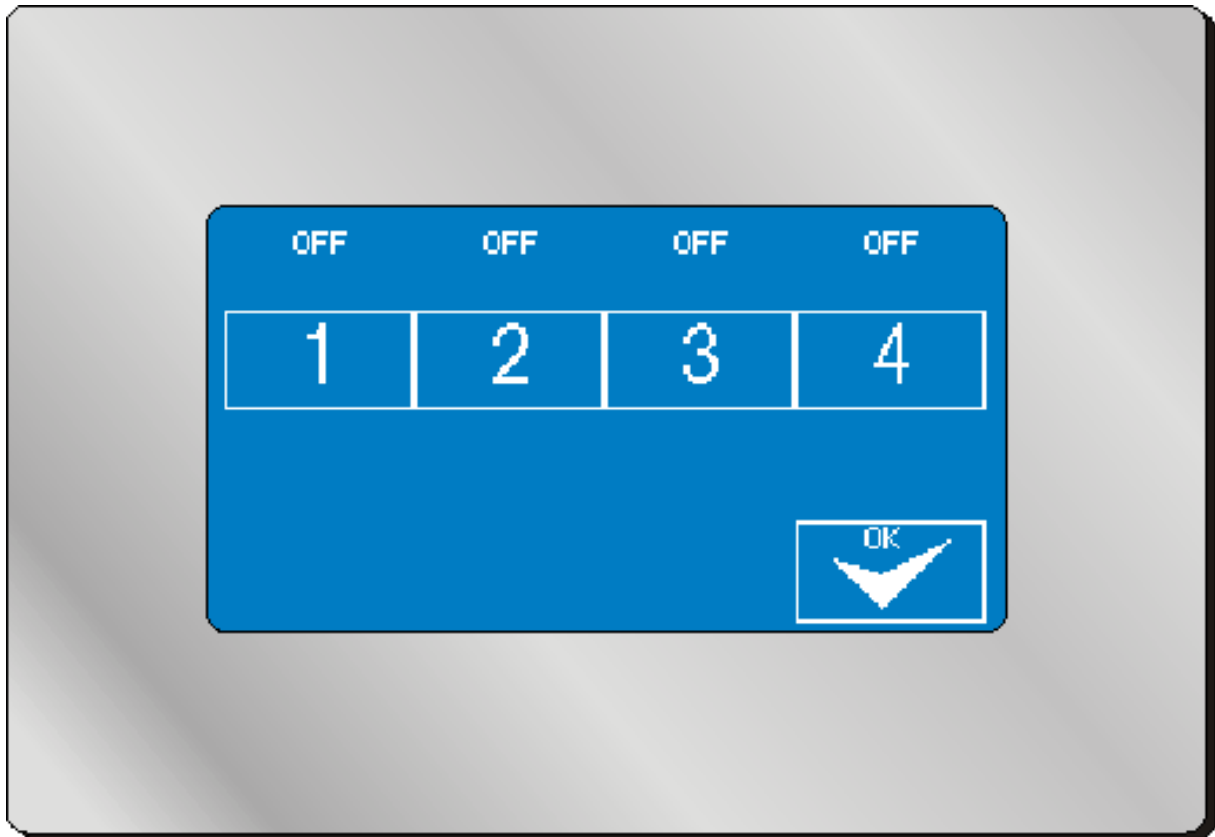
The display, too, should receive new updates in exceptional cases only, and only by authorized and qualified personnel. However, should you press this key, PLC switches into the receive mode for new display software which in turn will be transferred to the display by PLC. The display signals „Waiting for data“.

You can only return from this mode to the normal operating mode by turning off the power supply or by pressing the “Reset” key on the PLC main board.

5.5.15 Optional Software (Only Available for Additional Hardware Options)

5.5.15.1 Control Flushing Pockets

If the option for the control of up to four flushing pockets for handguns is connected to the system, the following screen will appear after pressing the “Spray” key:



The guns 1 to 4 can be activated or deactivated individually (on = active / off = inactive).

The filling process will then be performed one after the other for via the corresponding flushing pocket for each activated gun.

When changing paints or flushing the system, only the guns that were active during the last spraying process will be cleaned one after the other. The defined flushing process will then run exactly once for each gun.

This mask will only be called up if the flushing process is started via the display. If the mixing process is called up via a remote control or a robot communication module, the last selected gun combination will be automatically applied again.

6 Maintenance

6.1 Cleaning and Maintenance of the Material Component

Protect the material component from spray mist. If it is necessary to clean the area with thinner, the power of the installation must be turned off because the metering sensors of the standard version are not EEx-proof.

Generally the installation must be cleaned by a complete flushing procedure after end of operation or during a longer spray interval to avoid hardening of the paint material in the installation.

→ See 5.2.3 Start Flushing Procedure

6.1.1 Cleaning of Hoses and Tubes

If the flushing procedures have been carried out properly, a special cleaning of hoses and tubes is not necessary. However, if reactions occur inside the system, replacement is recommendable in order to avoid solid parts coming off and entering into the system gradually.

6.1.2 Maintenance of Valves

If a color change valve has not been used for a longer period it is recommendable to disassemble the color supply unit and to flush the valve, otherwise solid parts might settle inside the valve.

If the valves do not operate properly or if air or fluid leaks occur, the seals must be replaced. Since the hardener valves are activated more frequently, a regular control of the valves is absolutely necessary. It is recommendable to service the valves in regular intervals.

You will find further details in Annex 10.5.

6.1.3 Maintenance of Metering Cells

Generally our metering cells are maintenance-free. If it should be necessary to clean blocked metering cells, please note:

Metering cells have to be treated according to the instructions of the manufacturer, Annex (10.4).


The accuracy of the metering cells must be controlled in regular intervals (calibration), because the use of abrasive or pigmented fluids will lead to wear which influences the accuracy of the gear wheels.


6.2 Cleaning of Control Module

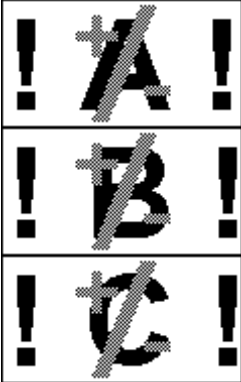
The control module must only be cleaned with a soft cleaning agent. There are no internal components or assembly groups which need cleaning or maintenance.


Cleaning of the touch-screen-display with solvents is not allowed. If you expect high grade contamination of the display there are slightly self-sticking transparent protection foils available which can easily be exchanged.

7 Alarm Messages and Troubleshooting

General Problem	Possible Cause	Solution
Alarm Message:  (no volume flow, A side)	Atomizing air is open without spraying	Set longer activating time for metering cell control Do not open atomizing air unnecessarily
	Tip clogged (no material flow with gun open)	Clean tip, replace if necessary
	Color change valve connected to wrong solenoid valve (no trigger air signal)	Check allocation of color change valves to solenoid valves
	Color change valve does not open although trigger air is applied	Disassemble color change valve, clean, replace seals (see service manual for valve)
	Lack of material	Check material supply system on A side (empty container?)
	Defective feed pump	Check functioning of pump (see service manual of pump)
	Blocked metering cell	Start flushing procedure, disassemble metering cell and clean if necessary
	Defective sensor on metering cell	Contact service technician, replace metering cell
	Cable rupture or wrongly connected	Meter cable, replace if necessary

General Problem	Possible Cause	Solution
Alarm Message:  (no volume flow, B or C side)	Atomizing air is open without spraying	Set longer activating time for metering cell control Do not open atomizing air unnecessarily
	Hardener pressure too low	Set hardener pressure to pressure of main color + approximately 10%
	Tip clogged (no material flow with gun open)	Clean tip, replace if necessary
	Color change valve connected to wrong solenoid valve (no trigger air signal)	Check allocation of color change valves to solenoid valves
	Color change valve does not open although trigger air is applied	Disassemble color change valve, clean, replace seals (see service manual for valve)
	Lack of material	Check material supply system on B side (empty container?) (alternatively C side)
	Defective feed pump	Check functioning of pump (see service manual of pump)
	Blocked metering cell	Start flushing procedure, disassemble metering cell and clean if necessary
	Defective sensor on metering cell	Contact service technician, replace metering cell
	Cable rupture or wrongly connected	Meter cable, replace if necessary

General Problem	Possible Cause	Solution
Alarm Message  (Mixing tolerance A/B/C exceeded)	Difference of pressure too high (injections too large) → Recognizable by heavy pulsations at the gun	Slowly reduce hardener pressure, reduce needle stroke at metering valve
	Uneven operation of feed pumps	Check pumps, clean and replace packings if necessary
	Incremental size selected too small	Adapt incremental size within the possibilities
	Flow rate too high (for example by filling without spray tip)	Adapt incremental size within the possibilities. Only fill with tip

General Problem	Possible Cause	Solution
Alarm Message  (Potlife expired)	Installation has not been flushed in good time	Start flushing procedure
	Not sufficient material removed from installation within pot life period	Start flushing procedure

8 Spare Parts and Options

8.1 Spare Parts and General Options

Item No.:	Description
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Merchandise Group Basic Installations Magic Flow

2K-2000	Magic Flow, electronic 2-component mixing und metering installation; electronic control cabinet, 600 x 380 x 210 mm with touch-screen, pneumatic / hydraulic control cabinet, 600 x 700 x 210 mm, equipped for 1 main color, 1 hardener, 2 flushing agents, metering range: 50-2000 ml/min per component. Compression-proof up to 250 bar, incl. 1 static mixer 300 mm length, 10x8 mm, Finishing Brands Order. No.: 2K-2000
2K-2001	Stand post, aluminum profile construction for 2-C installation, height: 1500 mm, depth: 400 mm; control cabinets can be mounted with height adjustment
2K-2002	Wheels set, 2 off guide rolls, 75 mm, antistatic, with double block-up brake, completely mounted

Merchandise Group Electronic Magic Flow

2K-2004	Expansion card for 8 solenoid valves, slot card for control "Magic Flow"; card will be pushed into the main board and delivers 8 digital 24V outputs to trigger solenoid valves. Cards are addressable for the valves 1-8, 9-16, 17-24 or 25-32; maximum of 6 expansion cards can be integrated into the control.
2K-2005	Signal output card, output card with 8 off 24V outputs to trigger external signals, e.g. "Alarm", "Flushing", "Fill" etc.; callipered power: max. approx. 400mA per channel, max. 2000mA total. Can be used to trigger directly signal lights, horns, etc.
2K-2049	Switching power supply 230VAC / 24VDC3.2A, 75W top hat mounted
2K-2073	Line safety switch, Characteristics: B16
2K-2050	Main board, supplied without output cards, supplied without display
2K-2051	Processor for main board, Chip set Siemens Infineon C1144 pre-programmed
2K-2052	Touch screen, LCD display with analogue touch field, 240 x 128 Pixel, CFL lightning, blue / white; pre-programmed for "Magic Flow"
2K-2074	Optoelectronic coupler input card; Optoelectronic coupler input 24VDC signal; connection for power supply, signal transmitter
2K-2064	Air flow control, adjustable, air connections: 3/8" (F) 24V power supply, signal output 24V (PNP switching)

Merchandise Group Spare Parts Magic Flow

2K-2011	Solenoid valve plate 3/2 controls "Magic Flow", 2 x 3/2 controls, 4mm
2K-2012	Solenoid valve plate 5/2 controls "Magic Flow", 1 x 5/2 controls, 4mm
2K-2071	Integrated gauge "Magic Flow", 010 bar, 40 mm, front montage
2K-2070	Air regulator "Magic Flow", "3/8" air regulator, range of adjustment 0-10 bar

Merchandise Group Fluid Part Magic Flow

2K-2015	Volumeter "Magic Flow" Volumeter, Stainless Steel 1/4" (F), P(max) 250 bar, metering range 50-2000ml/min, slide bearing
2K-2016	Single Pickup "Magic Flow" Pickup for volumeter, not EEx-proof, connection M12, four conductor
2K-2017	Single Pickup "Magic Flow", EEx Pickup for volumeter, EEx proof, connection M12, four conductor
2K-2018	Section switch amplifier Section switch amplifier for volumeter, 1-channel design for top hat
2K-2019	Pair of gear wheels "Magic Flow" Pair of gear wheels incl. slide bearing bush, ca. 8.800 impulse / liter
2K-2020	Shaft volumeter "Magic Flow"
2K-2021	Connecting cable volumeter "Magic Flow" Connecting cable, 5m, yellow (not EEx)
2K-2022	Extension cable volumeter per meter alternatively yellow or blue

Merchandise Group Options Magic Flow

2K-2006	EEx-proof kit "Magic Flow" Conversion kit for "Magic Flow", includes: 2 off EEx sensors for volumeter (in exchange for standard sensors), 1 off EEx solenoid valve (5m cable), 2 off section switch amplifiers
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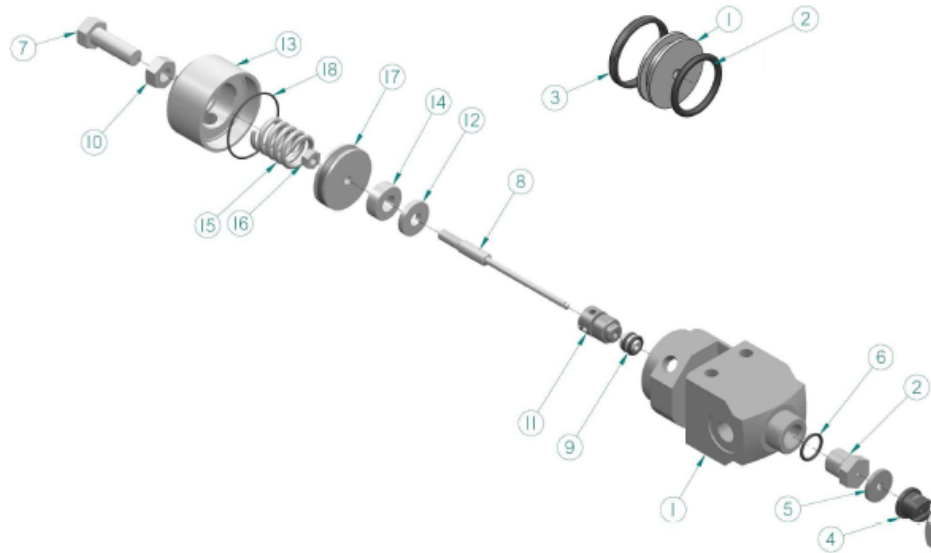
2K-2007	<p>Robot communication kit</p> <p>8 off optoelectronic coupler inputs</p> <p>8 of optoelectronic coupler outputs</p> <p>In top hat housing, for connection to PLC bus, cable length max.: approx. 1m</p>
2K-2008	<p>Transceiver kit</p> <p>2 off transceiver units for PLC bus "Magic Flow"</p> <p>- without cable</p> <p>- for the connection of external PLC modules for a distance of more than one meter</p> <p>Recommended cable to connect the units: CAT5 / CAT6 network cable, twisted pair, shielded</p>
2K-2026	<p>Non-ex remote control with recipe display (additionally, a transceiver kit 2K-2008 is required)</p>
2K-2047	<p>Ex remote control (category 2) with recipe display (additionally, a transceiver kit 2K-2008 is required)</p>
2K-2010	<p>Pneumatic remote panel for Magic Flow</p> <p>3 functions: Start / Stop / Flushing</p> <p>3 off P/E converter and 3 off pneumatic buttons</p>
2K-2072	<p>Isolated design (2 off metering cells) Magic Flow</p> <p>Dual pick-up for metering cell with fiber optic output, fiber optic cable (5m), fiber optic receiver and Lithium battery. EEx-proof. Two sets each, including an external solenoid valve, which will be installed as close as possible to the fluid part, but outside the high voltage area.</p>

8.2 Components with Spare Parts Lists

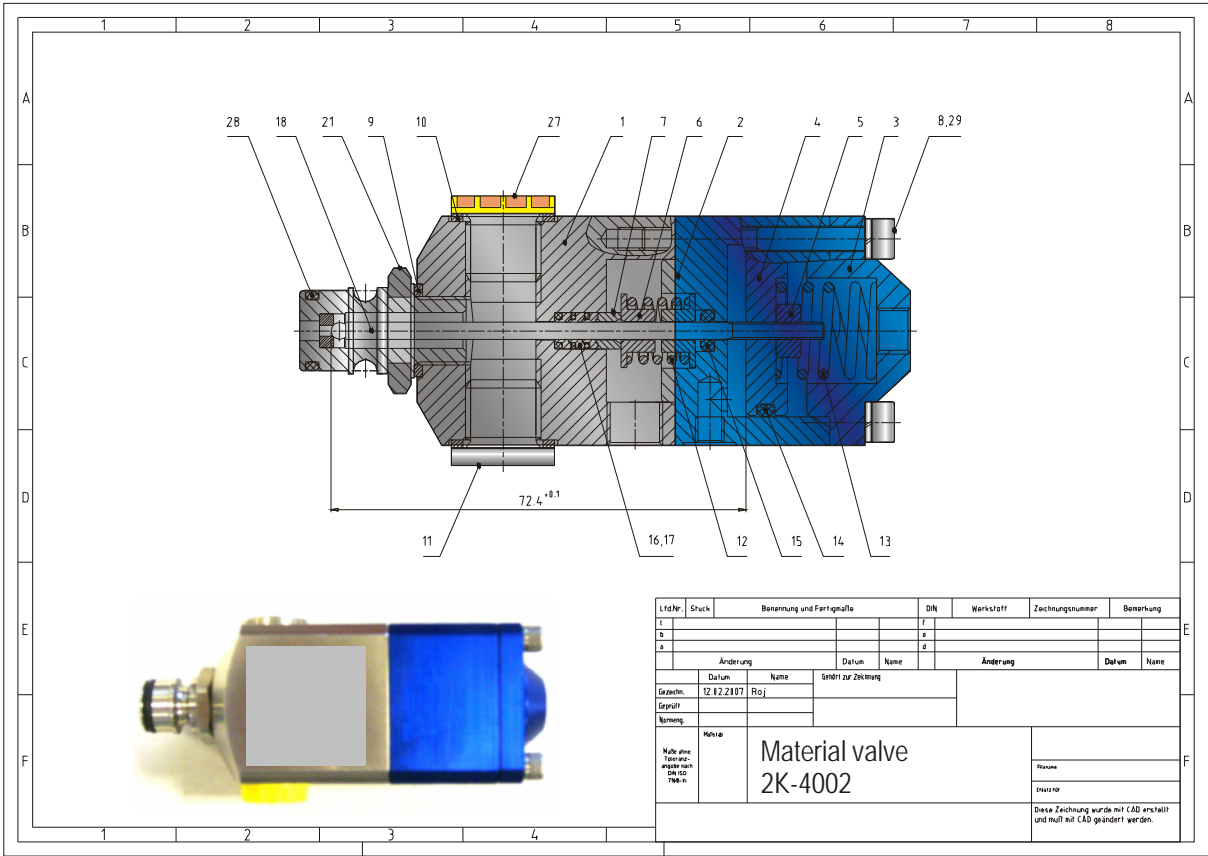
8.2.1 Service Kits Material Valve 2K-2014

Service Kit 2K-2044 includes the items 6, 9 and 14 (1 each)

Service Kit 2K-2059 includes the items 2, 3, 7, 10, 11, 14, 15 and 20 (1 each)

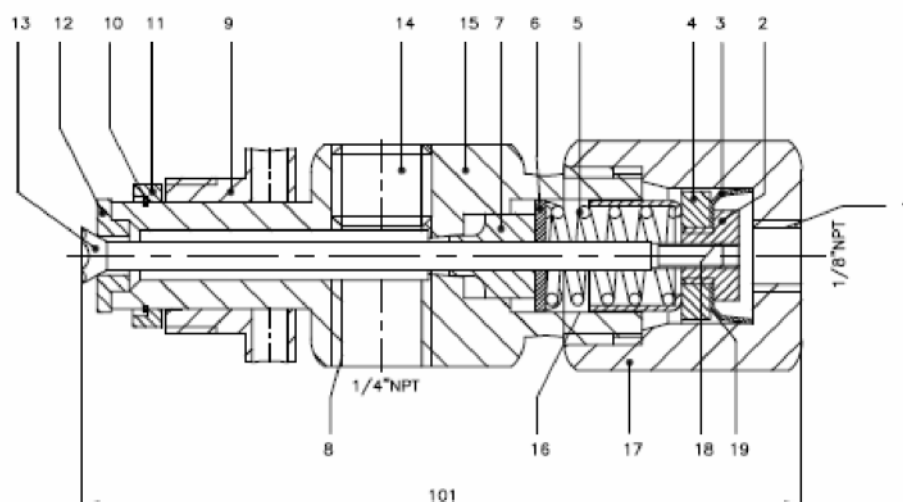


8.2.2 Material Valve 2K-4002



Pos.	Qty.	Unit	Name	Standard code designation	Remarks
1	1	pcs.	Valve body		2K-4100
2	1	pcs.	Air cylinder		2K-4101
3	1	pcs.	Cap		2K-4102
4	1	pcs.	Piston		2K-4103
5	1	pcs.	Nut		2K-4104
6	2	pcs.	Spacer		2K-4105
7	1	pcs.	Packing holder		2K-4106
8	4	pcs.	Fillister head screw	M4 x 40 DIN 912-8.8 vz	2K-4107
9	1	pcs.	Sealing ring	12 x 16 x 1.5	2K-4108
10	2	pcs.	Sealing ring	14 x 18 x 1.5	2K-4109
11	1	pcs.	Fastening screw	G ¼	2K-4110
12	1	pcs.	Compression spring		2K-4111
13	1	pcs.	Compression spring		2K-4112
14	1	pcs.	O-ring	25.3 x 2.4	2K-4113
15	1	pcs.	O-ring	3.3 x 2.4	2K-4114
16/17	1	pcs.	Seal kit	3 x diaphragm / 3 x O-ring	2K-4115
18	1	pcs.	Valve needle		2K-4116
21	1	pcs.	Locking piece with valve seat	11/16" x 1 6 UN	2K-4117
27	1	pcs.	Screw plug	G ¼	2K-4118
28	1	pcs.	O-ring	Ø 10 x 2 Viton	2K-4119
29	4	pcs.	Spring washer	4A, DIN 7980 vz	2K-4120

8.2.3 Material Valve CCV-403-SS-E (Low Pressure)



Pos. Item	Anz. Qty.	Benennung Description	Teile-Nr. Part No.	Zeichn. Nr. Draw. No.	Bemerkungen Remarks / Supplier
1		Steuerluftergang 1/8"NPT(F) Air Inlet 1/8" NPT(F)			
2*	1	Haltemutter Clamping Nut	CCV-45		
3*	1	Manschette Cup	VA-246		
4	1	Mutter Nut	CCV-3		
5	1	Druckfeder Spring	CCV-41		Ersatzteilsatz CCV-41-K2 Spare Part Kit CCV-41-K2
6	1	Druckscheibe Spring Washer	CCV-4		
7*	1	Nadeldichtung Valve Needle Seal	CCV-8		Ersatzteilsatz CCV-8-K2 Spare Part Kit CCV-8-K2
8		Material-Einlaß (2-fach) 1/4"NPT(F) Fluid Inlet (2 ports) 1/4"NPT(F)			
9	1	Schraubenhülse Spanner Nut	CCV-13		
10	1	Sprengring Retaining Ring	SST-8436		Ersatzteilsatz SST-8436-K5 Spare Part Kit SST-8436-K5
11	1	Ring Ring Retainer	CCV-44		
12*	1	Ventilsitz Poppet Seat	CCV-40		Ersatzteilsatz CCV-40-K2 Spare Part Kit CCV-40-K2
13*	1	Ventilnadel Stem	CCV-39		Reparaturatz KK-4841 bestellen Order Repair Kit KK-4841
14	1	Blindstopfen Pipe Plug	SSP-1421		Wird mit Ventil lose mitgeliefert. Nicht benötigt bei Farbzirkulation. Shipped loose with valve. Not used if material is recirculated.

* In Reparatursatz KK-4841 enthalten

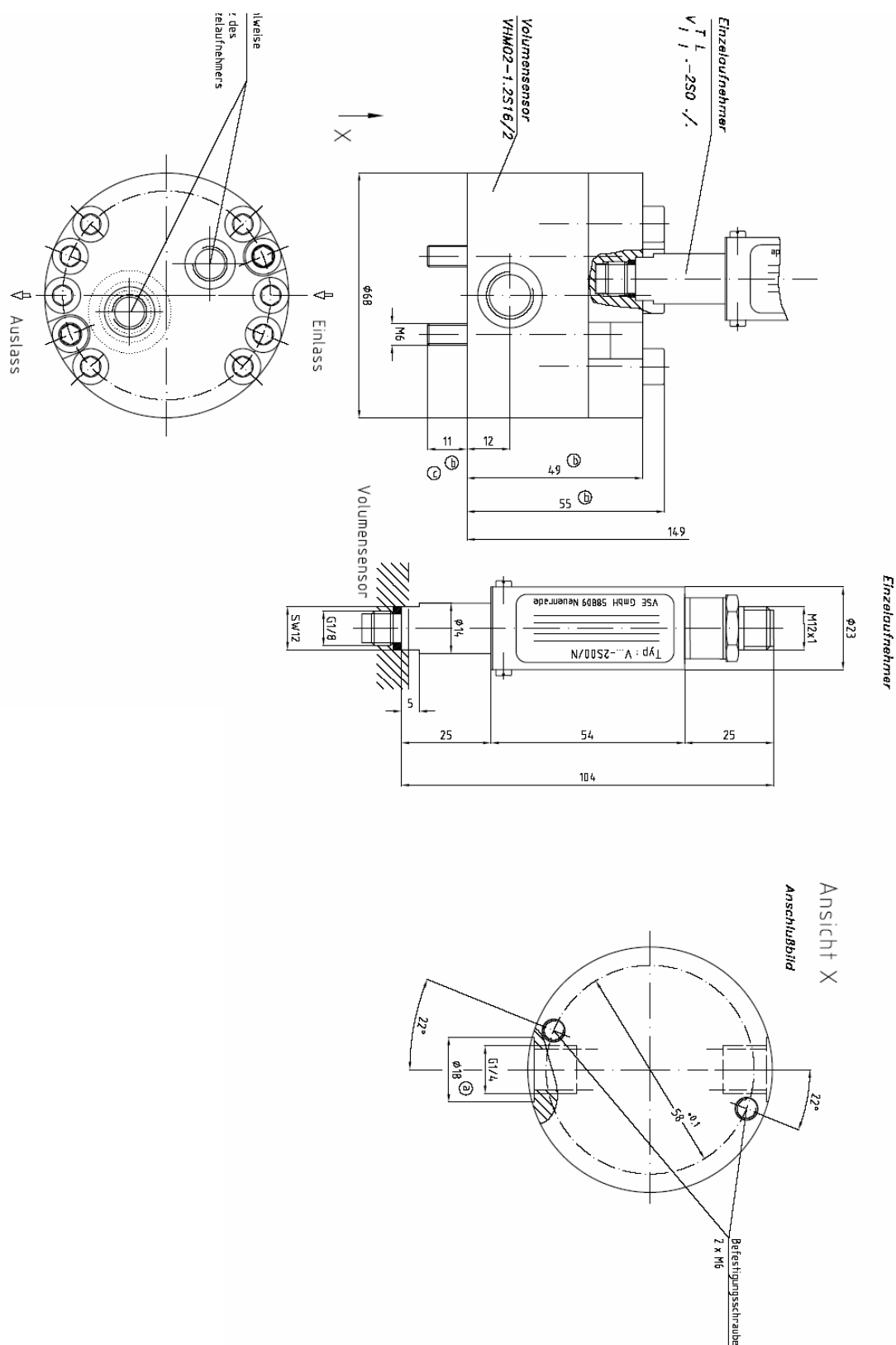
* Supplied in Repair Kit KK-4841

Pos. Item	Anz. Qty.	Benennung Description	Teile-Nr. Part No.	Zeichn. Nr. Draw. No.	Bemerkungen Remarks / Supplier
15	1	Ventilkörper Valve Body	CCV-15-SS		
16	1	Schaltanzeiger Valve Indicator	CCV-42		
17	1	Ventilkappe Valve Cap	CCV-43		
18		Klebstoff mittlerer Festigkeit Binding Material medium strength grade	Loctite #242		An 2 Stellen auf Gewinde auftragen Use on threads - 2 places
19		Leichtes Schmierfett Light grease			Bei Montage dünnen Film auf Bohrung und Manschette auftragen Apply a thin film of lubricant to bore & cup at assembly
-		Schlüssel (nicht gezeichnet) Spanner Tool (not shown)	CCV-7		
		Ring Ring Retainer	CCV-44		

* In Reparatursatz KK-4841 enthalten

* Supplied in Repair Kit KK-4841

8.2.4 Volumeter 2K-2015



Spare Parts for Volumeter 2K-2015

For the volumeter the following spare parts and wear parts are available

Pair of gear wheels	2K-2019
Shaft gear wheel	2K-2020
Disc washer (material PTFE)	2K-2057 or
Disc washer (material Viton, FEP sheathed)	2K-2058

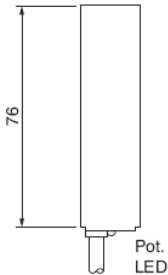
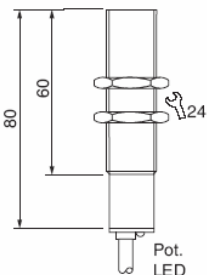
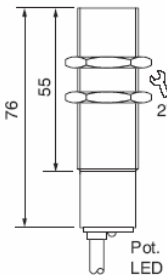



Other volumeters are available on request (higher or lower resolutions, various bearings).

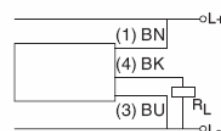
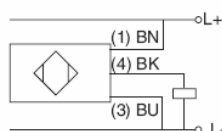
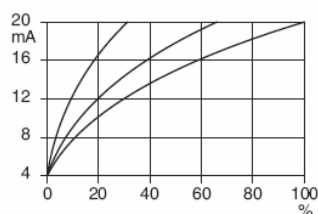
8.2.5 Airflow Control for Atomizing Air LG 518 GSP – Part No. 2K-2053

DC 24 V
PNP-Ausgang
Analog-Ausgang

LED-Anzeige
Lufterfassungsbereich 0,5...15 m/s



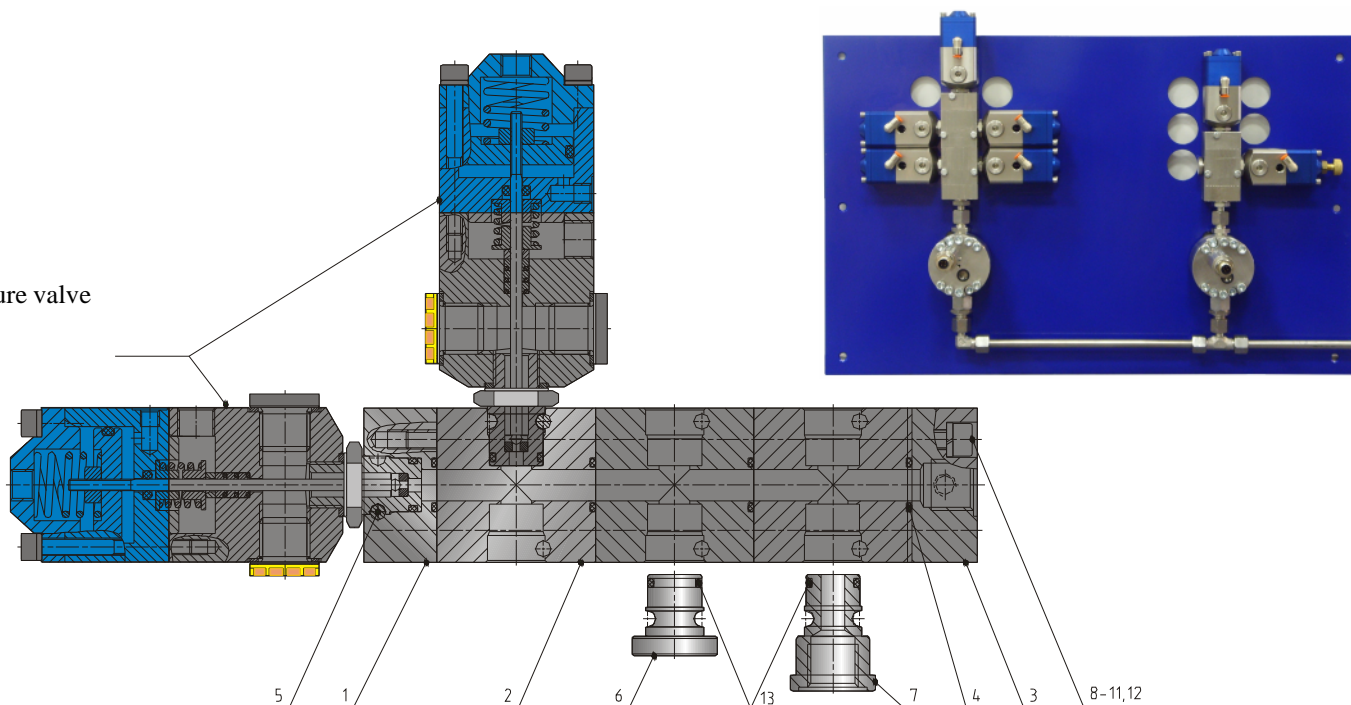
Ausführung	ø 20 mm		M18x1		M22x1
Abmessungen					
Erfassungsbereich			0,5...15		
Ausgang					
Best. Nr.	P11096		P11097	P11237	
Typ	LN 520 GSP		LN 520 GA	LG 518 GSP	
Schaltstrom	200		–	200	
Last R _L	–		200-500	200-500	
Betriebsspannung			24 DC ± 20%		
Stromaufnahme			70		
Umgebungstemperatur			-20...+70		
Temperaturgradient			200		
Bereitschaftszeit			20...40		
Reaktionszeit typ.	2		3	2	
Gehäusewerkstoff	PBT		PBT	PBT / Ms-Ni	
Anzeige Strömung			LED		
Schutzart			IP 67		
Anschluss	2 m PVC-Kabel, 3x0,5 mm ²				





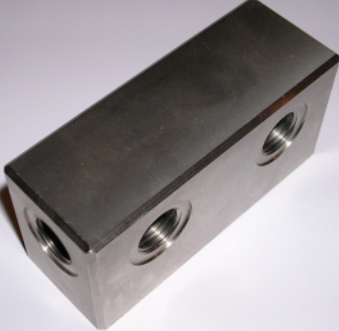

8.2.6 Accessories Material Valve





New paint changing system (from the 4th quarter of 2007)

High-pressure valve
2K-2004



No.	Qty.	Name and finished dimensions	DIN	Material	Remarks
1	1	End plate push-fit fitting		14305	2K-4121
2	1	Spacer		14305	2K-4122
3	1	End plate G 1/4i		14305	2K-4123
4		O-ring Ø 10 x 2 Viton			2K-4124
5		Hex. socket screw M4 x 40	931	8.8-vz	2K-4125
6		Dummy plug		14305	2K-4126
7		Plug G 1/4i		14305	2K-4127
8	4	Clamping screw M5 x 16 IP1+31	912	8.8-vz	2K-4128
9	4	Clamping screw M5 x 60 IP1, 1x2+31	912	8.8-vz	2K-4129
10	4	Clamping screw M5 x 100 IP1, 2x2+31	912	8.8-vz	2K-4130
11	4	Clamping screw M5 x 140 IP1, 3x2+31	912	8.8-vz	2K-4131
12	4	Spring washer A5	7980		2K-4132
13		O-ring Ø 10 x 2 Viton			2K-4133

	2K-2027	Return valve ¼" BSP → M16x1,5
	2K-2029	Color change stack, 2 + 2 (until 2007)
	2K-2030 2K-2031	Color change stack, 4 + 2 Color change stack. 6 + 2 (until 2007)
	2K-2032	Fitting ¼" BSP → M16x1,5

	2K-2033	Screw plug 1/4" BSP, short version for color change stack
	2K-2034	Disc washer Stainless Steel for color change stack (until 2007)
	2K-2035	Adapter for high pressure valve on color change stack (until 2007)
	2K-2036	Seal 1/4", aluminum

	51410L14	Adapter, adjustable, ¼" BSP to M16x1,5
	2K-2160	Adjustable T-screw connection, M16x1,5
	2K-2038	Adjustable L-screw connection, M16x1,5

8.2.7 Touch Panel



TOUCH PANEL ADJUSTMENT

The touch panel is adjusted on delivery and can be used immediately. Due to aging and wear, it may be necessary to readjust the touch panel.

Adjustment procedure:

1. When switching on, touch the panel until the following message appears:
"touch adjustment ?"

Now, you can stop touching the panel.

2. Within one second, touch the panel again for at least one second.
3. Follow the instructions for the adjustment (touch the two points on the top left and bottom right corner of the panel).

The touch panel is available under article number 2K-2052. Alternatively, e.g. in case of a glass breakage, a replacement display can be obtained under the article number 2K-2052-REP.

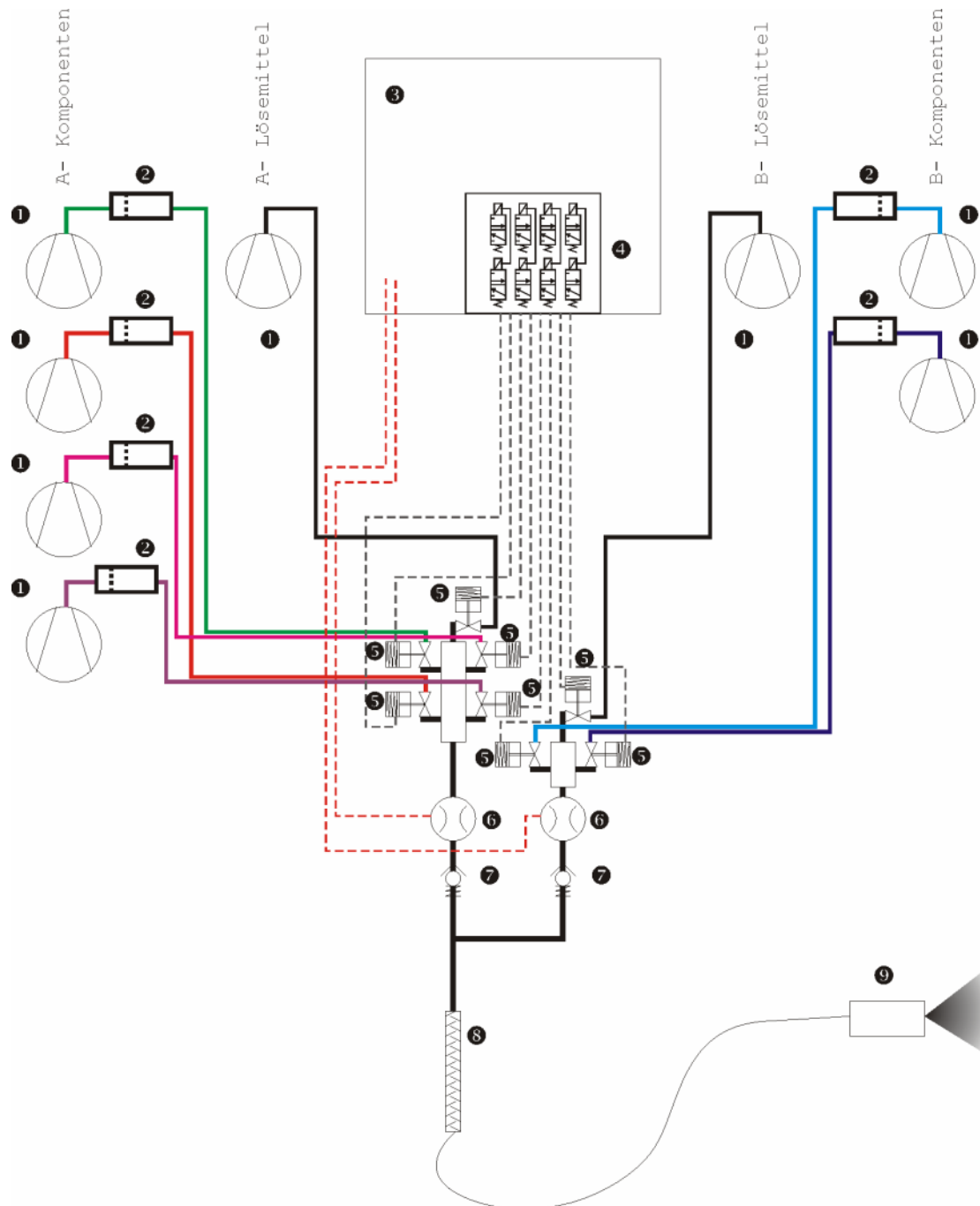
9 Installation Shut-off

If the installation shall be shut-off for a longer period of time the following steps must be carried out:

1. Carry out at least one complete flushing procedure in order to remove mixed material from the installation.
2. Depressurize all fluid supply systems.
3. Open manually all connected valves via the relevant menu, in order to relieve residual pressure.
4. Remove all supply hoses from the color change valves.
5. Connect the flushing agent supply system to each valve in succession, open the valve manually and flush it via the gun or via a hose connected to the outlet.
6. Remove the flushing agent supply system.
7. Fill into each valve some milliliters preservative agent and close it with a screw plug.
8. Remove the electrical and pneumatic supply connections.
9. Store the installation at a dry location.

10 Annex

10.1 Flow Chart



Legend:

- 1 Fluid supply system (e.g. piston pump)
- 2 Filter
- 3 Control cabinet
- 4 Solenoid valve
- 5 Color change valve
- 6 Flow metering cells
- 7 Return valves, spring tensioned
- 8 Static mixer
- 9 Spray applicator (e.g. manual gun)

10.2 Connect Material Component and Electrical Cabinet

The material cabinet and control cabinet are delivered separately in the basic version. After mechanic assembly air- and cable connections must be made between the two separate units. Proceed as follows:

1. Connect the air outlet of the electrical control cabinet with the air inlet of the fluid cabinet (10 mm air hose).

2. Connect the metering cell cables (yellow) as follows:

Main color:

- black and brown lead onto +24V of the CNT0- insert card
- blue and silver lead (sheath) onto GND of the CNT0- insert card
- white lead onto CNT + of the CNT0- insert card
- connect also CNT- with GND via a cable jumper on the CNT0- insert card

Hardener:

- black and brown lead onto +24V of the CNT1- insert card
- blue and silver lead (sheath) onto GND of the CNT1- insert card
- white lead onto CNT+ of the CNT1- insert card
- connect also CNT- with GND via a cable jumper on the CNT1- insert card

3. Connect the control cable of the solenoid valve island as follows:

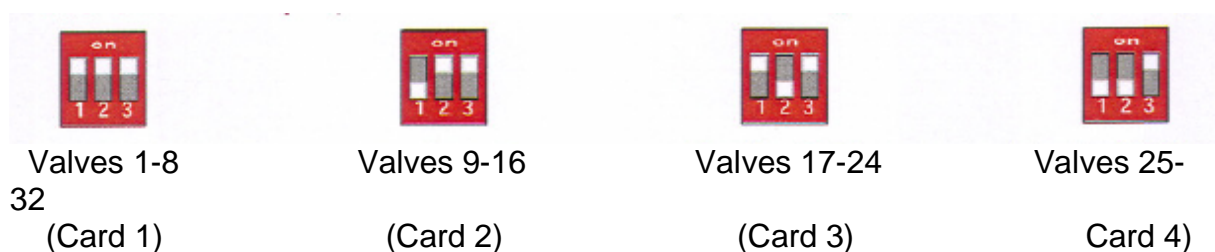
The solenoid valve island has a 25 channel cable (orange). The green/black lead builds the +24VDC reference connection, all other cables will be connected to the digital output cards of "Magic Flow".

The output cards have 10 connecting terminals:

GND ; 24V ; DO.0 ; DO.1 ; DO.2 ; DO.3 DOA ; DO.5 ; DO.6 ; DO.7

Attention: GND will not be wired!

Via an address jumper it can be defined which solenoid valves will be triggered by the respective card.



A solenoid valve island can have a maximum of 24 off 3/2 control valves. If more than 24 valves shall be triggered, another solenoid valve island is necessary. In the following chart the first solenoid valve island is called „A“ and the second solenoid valve island „B“. If using a second solenoid valve island the green/black lead must be connected to „24 V“ of card 4. Green/black of the first solenoid valve island must be connected to „24 V“ of card 1.

Valve	Lead	Connection	Card	Valve Island
1	blue/black	DO.0	1	A
2	red/brown	DO.1	1	A
3	white/black	DO.2	1	A
4	red/blue	DO.3	1	A
5	black/orange	DO.4	1	A
6	yellow/red	DO.5	1	A
7	black/brown	DO.6	1	A
8	white/red	DO.7	1	A
9	red/black	DO.0	2	A
10	brown/white	DO.1	2	A
11	red/orange	DO.2	2	A
12	light blue	DO.3	2	A
13	yellow/white	DO.4	2	A
14	yellow	DO.5	2	A
15	red/green	DO.6	2	A
16	orange	DO.7	2	A
17	orange/white	DO.0	3	A
18	green	DO.1	3	A
19	yellow/black	DO.2	3	A
20	white	DO.3	3	A
21	white/blue	DO.4	3	A
22	brown	DO.5	3	A
23	green/white	DO.6	3	A
24	red	DO.7	3	A
25	blue/black	DO.0	4	B
26	red/brown	DO.1	4	B
27	white/black	DO.2	4	B
28	red/blue	DO.3	4	B
29	black/orange	DO.4	4	B
30	yellow/red	DO.5	4	B
31	black/brown	DO.6	4	B
32	white/red	DO.7	4	B

10.3 Technical Characteristics

General Data:

Kind of protection of the control part:	IP 52
Kind of protection of the fluid part:	EEx-proof for operation in EEx-Class 2
Optional:	EEx-proof for operation in EEx-Class 1

Materials for fluid contacting parts:
Stainless Steel, PTFE, Polyamide

Special Data:

Software:

Freely adjustable recipes:	50
Trigger able components:	32
Deposit able parameters:	No. A + B + C, mixture ratio, Pot life, optional fluid pressure
Adjustable flushing parameters: 20 steps, valve number each, quantity or time, dump valve	
Storage of consumption of all components	
Mixture ratio:	0 – 200% metering on to main component (100%)

Hardware:

Mixing accuracy:	better than 1% (according to calibration)
Volume flow:	according to design, standard 0,05- 2 l/min
Maximum operating pressure:	10 bar (standard version) optional up to 250 bar (versions with higher pressure are available on request)

Measurements:

Height:	1600 mm (incl. rolls set and stand post)
Width:	640 mm
Depth:	400 mm

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

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